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AMERICAN ANTIQUITY

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# THE PIT HOUSE IN THE OLD WORLD AND IN NATIVE NORTH AMERICA

HIROSHI DAIFUKU

THE PROBLEM of the origin and distribution of semi-subterranean structures is an intriguing one. It is generally accepted that the semi-subterranean structure, earth lodge, or pit house, was one of a number of relatively unmodified traits of Old World origin found in North America. This paper reviews some of the literature on the pit house, and summarizes its development and distribution in the Eurasian and North American continents.

Laymen, believing that early man habitually lived in caves, commonly use the stereotyped term "cave man" in referring to our early progenitors in the Old World. This assumption was an inevitable development since occupational sites in western Europe are predominantly caves or cave shelters. However, some European archaeologists have suggested such sites were seasonally occupied—that they were the winter habitations of man during the upper Paleolithic. There is reason to believe different types of shelters were used during warm seasons since engravings of tents or more substantial structures (tectiforms) have been found on the walls of caves and cave shelters. A number of European archaeologists including Breuil (1910), Clark (1939), Childe (1950), and others have accepted tectiforms as evidence of the existence of artificial structures in western Europe during the last glacial advance. Breuil has gone further and compared some of the tectiforms in the Font-de-Gaume, the Dordogne Valley of France, to the summer huts of Navahos described by Mendeleff in 1896.

The first certain evidence that during the upper Paleolithic man was not necessarily a troglodyte has been found in southern Russia. Here in the broad flat lands where (except for the Crimea and the Caucasus) caves or rock shelters are absent, man used the insulating qualities of earth to build semi-subterranean houses. One of the best known of these sites is Gagarino which is believed to be of Gravettian age. Gagarino is located on the right bank of the Don River about five kilometers north of the junction of the Sosna, a tributary stream. Here peasants discovered a house pit while excavating a silo trench. Unfortunately, the trench cut through the center of the house pit along its major axis and presumably destroyed the hearth and entrance. Zamiatnine (1934), who excavated this site during 1926-29, found a house pit roughly oval in outline about 5.50 meters long and 4.50 meters wide. The floor was located 40 to 60 cm. below the occupational surface. The walls of the pit were lined with the long bones of rhinoceros and mammoth, including the tusks and lower jaws of the latter, as well as with sandstone slabs. The wealth of material remains found in this one house pit is seen in the recorded finds of some six hundred flint implements, over a thousand blades, and proportionately large numbers of cores and waste flints. Artifacts of bone as well as several "venus" figurines completed the roster of nonlithic material.

Russian archaeologists have also discovered large semi-subterranean houses used during the upper Paleolithic which seem to have been communal dwellings. An example of such a site is Kostienki I which is late Aurignacian in date. Kostienki is located on the right bank of the Don River about thirty-five kilometers south of Voronezh. A considerable number of artifacts were found concentrated in a hollow in the old loess, and further excavation revealed a house pit which was roughly oval in outline, 35 meters long and 15 meters wide. Nine, possibly eleven, hearths set 2 meters apart were found along the major axis of the building. One of the features of the excavation was the presence of unbroken artifacts at floor level, while those in the fill were in a fragmentary condition. Efimenko's report (Childe, 1935;

1950), suggested that the layer of broken implements was once incorporated in earth which had been used to cover the roof. He thought that the subsequent collapse of the roof, following the abandonment of the pit house, resulted in the spread of refuse (including fragmentary artifacts) over the floor. As at Gagarino, the margins of the house pit were lined with mammoth bones and a considerable number of lithic artifacts as well as "venus" figurines were recovered. Unfortunately for comparative purposes a plan of Kostienki I and evidence for the type of superstructure which may have been built has yet to be published.

In spite of the absence of further reports on Kostienki I, the probability remains that the huge structure was a communal shelter of some sort. Confirmation of the existence of communal pit houses during the upper Paleolithic is found in the site of Pushkari, of Gravettian date, on the Desna River (Childe, 1950). The Pushkari pit house was slightly smaller than the one at Kostienki. It was similar in shape, being an irregular oval 12 meters long and 4 meters wide. Three hearths were found in the house pit arranged along the major axis of the oval. In the floor were some thirty holes concentrated about the central hearths. These holes were found filled with flint, ashes and bones. Boriskovskii believed that these holes were storage cists, while Childe suggested some of them may have been post holes.

Two longer and more capacious pit houses, which are Magdalenian in date, have been reported from another site at Kostienki (Kostienki IV) (Childe, 1950). These house pits were long irregular hollows excavated in the soil. House "A" was approximately 34 meters long and 5.5 meters wide; House "B," which lay 15 to 20 meters away from "A," was 21 meters long and 5.5 meters wide. "A" was distinguished by having low transverse ridges which divided the house pit into three compartments. In addition to hearths, there were many deeper hollows in the floors in both Houses "A" and "B." The lower portions of these hollows were colored bright red and filled with rabbit bones. Rogachev considered them to be storage pits, and Childe again suggested some may have been post holes.

Finally, besides these more or less isolated sites, the Russians have excavated a pit house village of late Magdalenian date. This is the site of Timonovka, located on the Desna River about four kilometers south of Briansk. Gorodtsov (Childe, 1950; Golomshtok, 1938) excavated six houses, rectangular in form, which were very regular in outline. Dimensions varied from 6 to 12 meters in length, 3.50 meters in width and 2.5 to 3.0 meters in depth. Traces of timber revetments along the vertical sides of the house pits are reported. Gorodtsov's hypothetical reconstruction of the Timonovka dwellings assumes a flat roof laid on horizontal logs set flush with the surface. Entrance was apparently effected through slanting passageways either into the long side or the short side of the rectangle. Some of the dwellings lacked hearths, but many stone lamps were found, and perhaps these lamps were used in place of hearths for light and heat.

One of the interesting features of Timonovka is the presence of detached storage cists which were located about the village. Four of the cists found were circular in outline and conical in cross section. Average dimensions were approximately 3.2 meters in diameter and 2.5 meters in depth. Besides isolated storage cists, three open air fire places and two working places were discovered.

Closer to the American scene is the site of Mal'ta located on the western end of Lake Baikal (Clark, 1939; Childe, 1950). Gerrasimov found traces of a rectangular semi-subterranean hut 4 by 3 meters in size. Of particular interest was the presence of a small "porch" antechamber attached to the main unit—a design which was commonly used in native North America. As in the early sites found in European Russia, the walls of the house pit were lined with stone slabs and mammoth bones. Other faunal remains were bones of reindeer, rhinoceros, wolf, horse, bison, etc. This site has been dated by the Russians as an early stage of the Siberian upper Paleolithic.

While it is not possible to demonstrate absolute continuity in the use of the pit house in the following Mesolithic period, it probably was one of the characteristic traits found among peoples possessing a sub-arctic culture in the Old World until recent times. There is considerable terminological confusion in describing the stage of cultural development of these post-Paleolithic sites. For example, the earliest sites in the middle and lower Ob valley are dated by the Russians as "Upper Neolithic" (Field and Prostov, 1942) on the basis

of the presence of pottery and polished stone chisels. Other lithic artifacts included scrapers, points and knives of hard slate and small scrapers and flakes of flint and quartz. Faunal remains indicated that the economy was typically Mesolithic—based on fishing and hunting, particularly the hunting of elk. Therefore, the term "sub-Mesolithic" (suggested by Clark, 1939), would be preferable as a descriptive term to refer to such post-Pleistocene hunting and gathering cultures characterized by the possession of later traits diffused from advanced cultural centers.

These sub-Mesolithic sites in the Ob have been provisionally dated in the second millennium B.C. One of the best preserved was a settlement on a sand promontory near the upper course of the Liapin River. This site, which was partially excavated by Boch during 1934, and Chernetsov in 1935, consisted of approximately twenty rectangular house pits. Some of these were large, measuring 25 by 25 meters, 20 by 22 meters, and 20 by 20 meters in size. The most common dimension was 10 by 10 meters, and the deepest house pit was sunk 3.0 meters below the surface.

In the northern part of the Ob territory Chernetsov discovered a settlement of marine mammal hunters on the Jamal Peninsula. Three pit houses were excavated which were characterized by central hearths and roofs apparently supported by vertical posts. Associated faunal remains included seal, walrus, polar bear and whale. Stone implements and potsherds were found in one house. Lithic artifacts included quartz scrapers, fragments of polished stone implements, and whetstones of sandstone and slate. Among the bone implements were arrowheads, chisels, spoons, spatulate scrapers and rowlocks. A few objects of iron were also present including arrowheads, a knife and a ring. The site is attributed to the first millennium A.D. These marine mammal hunting sites have been discovered stretching from the eastern shores of the White Sea to the western shores of Nordenskiold Sea. Chernetsov believed this culture lasted with little change from the middle of the first millennium B.C. to the middle of the second millennium A.D.

Further to the east, along the Pacific coast of northern Asia, Jochelson has reported a number of pit house sites. During 1910-11 he discovered a series of pit houses in Kamchatka (Jochelson, 1928). Most of the house pits he found were square or rectangular in outline, although some roughly circular ones were also found. All of these structures had simple side entrances and none were of great age. Objects such as 11th century Japanese bronze coins and pieces of porcelain cups were typical inclusions.

At the time of Russian penetration into northeastern Siberia during the 18th and 19th centuries the pit house was still in use among the palae-Asiatic peoples. The typical Koryak hut (Jochelson, 1906) was a fairly large rectangular structure 12 or more meters long, sunken to a depth of 1.0 meters to 1.3 meters (three or four feet). A side entrance passage was always present but used only during the warm season. During the winter this passage was fenced with logs, straw, earth and snow, and was only unplugged to serve as a ventilator passage when a fire was laid in the hearth. The winter entrance was the smoke hole, and a log ladder drilled with holes at regular intervals into which the toes of the feet were inserted was used.

The side entrance was commonly found in archaeological sites as well as in pit houses which were in use in recent times in northeastern Asia. Among many palae-Asiatic groups the smoke hole entrance had ceremonial significance. This enhanced view of the smoke hole as the preferred entrance varied among different peoples. The Gilyak ordinarily used the side entrance but descended through the smoke hole with the skin and flesh of a freshly killed bear during their bear festival. The Kamchadal, on the other hand, reserved the smoke hole entrance for the use of men who entered and departed by means of a notched log ladder. The Kamchadal pit house was also equipped with an underground passage which began at the hearth and emerged at the side of the building. This passage was a narrow channel which functioned as a ventilator shaft and was also used as an entrance passage by women, children and transvestites.

On the American continent there is further evidence for the antiquity and continuous use of semi-subterranean structures. In the Alaskan area Larsen and Rainey (1948) classified pit houses into two broad types. This was a functional division, and based on major differences in design. These two types were named

by the authors (1) the Ipiutak or "Alaskan" house, and (2) the "Arctic Whale Hunting" culture or Point Barrow culture. The Alaskan house was essentially the basic pit house design using central roof supports which resembled most closely palae-Asiatic types. It was usually a square with slightly rounded corners, each side being 4 to 5 meters long. The hearth was set in the middle of the floor west of center. The walls were believed to have consisted of perpendicular logs or poles, and the roof probably was in the form of a truncated pyramid. The authors believed, on the basis of their excavations, that all the Ipiutak houses had a side entrance and some sort of storm shed over it. The bottom of the entrance passage was either slightly above floor level or at floor level. In some areas the passage had a cold trap—that is, the base of the passage was below the level of the floor of the main building. This type of pit house, with variations, has been found throughout most of the Eskimo territory.

The Point Barrow type of house, built by peoples who possessed the "Arctic Whale Hunting" culture, differed from the Alaskan or standard type in several features. It was characterized by (1) heavy sod walls, (2) a long sunken entrance passage with recesses used for cooking rooms, storage and other purposes, (3) absence of a hearth since seal oil lamps furnished light and heat, (4) a rear platform, (5) a roof structure supported by walls instead of by poles. This type of construction was specialized for extreme polar temperatures, resulting in a much more comfortable winter house than the Alaskan type of pit house. Larsen and Rainey believed this specialized form had fairly respectable age. The Birnirk culture had houses of this type which were rectangular structures built of perpendicular logs, heavy sod blocks and whale bone. However, they considered the Alaskan type was the older of the two house types in the Eskimo area.

South of the Eskimo cultural area the pit house is found in a continuous pattern of distribution along the Pacific coast. Waterman (1921) has divided this into two broad areas: (1) semi-subterranean houses found inland from the coast which were similar to the Alaskan and Asiatic types, (2) rectangular plank houses along the sea coast which terminated at central California. The latter were characterized by a number of variations in roof construction, but all were rectangular in form and all possessed a pit. Waterman believed these plank houses were developed from the pit house, although their shape was determined by the limitations of the material used. He pointed out in substantiation that all of the plank houses had pits built in association with them. Furthermore, many of the myths and ceremonials in use by peoples who built plank houses recapitulated the existence of semi-subterranean dwellings entered through a smoke hole.

The pit house itself is found with minor variations inland from Alaska to central California. In central California, large pit houses were used in the Kuksu cult. These buildings were approximately circular with a domed roof resting upon posts and roof beam logs. South of this area tribes like the Yokuts lacked the ceremonial earth lodge, but they did construct small earth covered buildings which were used for sweating and sleeping purposes. The plan of these small lodges, according to Kroeber (1925), was essentially similar to those used by the central Californian tribes. The earth semi-subterranean house was also found in southern California where it was used for domiciliary purposes.

The earth lodge was the common domiciliary structure in use among the river valley tribes in the plains, including such historic groups as the Arikara, Mandan, Hidatsa, Oto, Omaha, Pawnee and Ponca. All of these groups practised maize agriculture and hunted the bison as a secondary source of food. There was little variation in the circular design of the historic structures found among the foregoing groups although the prehistoric lodges were rectangular. All of the historic houses were essentially shallow pit houses. They were characterized by a circular ground plan, a sheltered passageway, a floor set a few inches below the surface, central fire pit, and a platform or series of platforms along the circumference of the building. Usually there were four central roof support posts, but some of the larger houses used five posts and occasionally an oval ground plan was used. The Hidatsa (Wilson, 1934), for example, built pit houses which varied from 10 to 12 meters in diameter and 3 to 4 meters in height. The principal earth lodge was occupied only during the warm season of the year, and was good for many years of use. This was the period when the tribe

congregated in palisaded villages near their maize fields. During the winter the village broke up into scattered units which lived in smaller, less carefully built, earth lodges erected in wooded areas for protection against the cold. The Hidatsa explained their winter earth lodge was poorly constructed because it was only occupied for one winter, then abandoned. By the turn of the century the Hidatsa had forgot much of the folklore concerned with the earth lodge, but it was clearly apparent that they regarded the structure as inherently sacred. Only selected women had the right to superintend the erection of the four main roof posts. Furthermore, these roof posts were believed to have "life," and offerings and prayers were made to them.

The Indians in the southwestern United States once built pit houses for domiciliary purposes. Sayles (1945) found pit houses were present in the San Pedro Stage of Cochise culture. These were simple oval pits with floors of hard packed earth. The fire areas were poorly defined, and evidence of roof support was absent. Some of the house pits, possibly all, had a side entrance with a wall step. One of the features of the San Pedro pit house was the presence of large internal storage cists which took up much of the floor space. In the following Peñasco phase, houses were shallow excavations with depressions in the floor serving as hearths. Holes for wall and roof support posts were found in only one of the pit houses which Sayles excavated and he suggested the usual method of construction was to rest the butts of the posts flush on the floor.

Morris (Wormington, 1947) has discovered pit houses which belong to the Basket Maker II period in Durango, Colorado. They are roughly contemporaneous with the late stages of Cochise culture and are characterized by an unusual method of construction. Basically, the foundation consisted of a circular shell made by laying wood and mud masonry upon which a cribbed roof was erected. Interior storage devices consisted of sub-floor slab lined pits, or of mud domes built upon the floor. The most common storage container used in this site was a combination of the slab lined pit superimposed by a mud dome.

In the succeeding Basket Maker III period the semi-subterranean house has been found varying in shape from the quadrilinear to the full circle. Either a side entrance passage or an antechamber was present usually located on the southern or eastern side of the pit house. An interesting feature of Basket Maker III pit houses was the general presence of a low ridge or wall which bisected the main floor. This partition usually separated the southern or eastern portion of the pit house from the rest of the structure. In this section archaeologists have frequently found manos and metates which suggest the partition demarcated the women's work chamber. Some support for this hypothesis was found in the common presence of what appears to be a *sipapu*—a hole in the floor located between the hearth and the northern boundary of the pit house — which indicated the northern or western portion may have been used for ceremonial purposes.

The typical Basket Maker III pit house village had a number of isolated circular storage cists associated with it. Toward the end of this period (Basket Maker III - Pueblo I) there was a tendency to build contiguous storage cists located to the north of the pit house. These contiguous storage cists gradually assumed more of the domiciliary functions of the pit house, and finally culminated in the multi-room masonry pueblo. The presence of hearths in what were contiguous storage cists suggests a change from storage to living quarters. As a result, the pit house lost its domiciliary function, and became primarily a ceremonial structure—the *kiva* of the modern Pueblos. One of the interesting changes in architectural design which accompanied this change in function was the abandonment of the entrance passage and antechamber. An example of such a change is reported by Roberts (1939) who found that one of the late pit houses equipped with an antechamber (excavated in Allantown) had burned in the course of its use. Following the fire the structure was rebuilt and the antechamber completely filled in, leaving in its place a ventilator shaft. The contiguous storage cists to the north of the remodeled semi-subterranean unit had hearths which not only indicated a shift in domiciliary habits, but also suggested that the side entrance was necessary only as long as the pit house had a dual function. The common presence of the ventilator shaft in place of an entrance passage in the modern Pueblo *kiva* reinforces the belief the pit house in the Southwest is of ultimate Asiatic origin. The ceremonial emphasis placed on the smoke hole entrance was paralleled by the similar practice found among many of the palae-Asiatics.

In summary, it is clear the pit house is characterized by considerable antiquity. It appears to have been a logical development utilizing the insulating qualities of earth to build shelters where natural features such as caves were absent. In its early stages of development it was one of a number of traits found in the late glacial period, and survived for a considerable length of time among peoples living in the circumpolar regions of both hemispheres.

Linton (1924) suggested the pit house is "associated with the earliest cultural stratum in the New World." Evidence substantiates his hypothesis. The semi-subterranean structure has been demonstrated to be the earliest domiciliary unit in use in the Eskimo area. It seems to possess considerable antiquity along the Pacific coast all the way to southern California. Linton has also pointed out the presence of a number of interesting parallels between the southwestern and southeastern United States as follows: (1) rectangular houses of adobe or stone in the Southwest, of wattle and daub in the Southeast; (2) *kivas* in the Southwest, family hot houses—semi-subterranean earth covered structures — which were also used as winter dwellings in the Southeast; (3) great *kivas* in the Southwest, town houses in the Southeast.

Waterman (1921) suggested the grass covered Caddoan hut was essentially similar to the pit house in architectural detail, and may form a possible link between the Southwest and the Plains. On the other hand, Linton (1924) believed the earth lodge was introduced into the Plains from the Lower Mississippi area through tribal movements, principally of the Mandan and Arikara. On the basis of the small degree of variation found in Plains earth lodge architecture and the surviving migration legends, he thought these tribal movements occurred in relatively recent times. Furthermore, he pointed out that some tribes which used the earth lodge in the Plains considered it a recent acquisition and recalled they had previously used the conical tipi. Linton considered the pit house was found from southern California in a continuous zone east to the Carolinas.

It may be significant that preceramic habitation sites along the Andean coast, such as Huaca Prieta in the Chicama Valley and Cerro Prieto in Viru Valley (Bennett, 1949) are characterized by the use of semi-subterranean houses lined with boulders. Indeed, when one considers the continuous temporal and spatial distribution of the pit house in northern Asia, from the upper Paleolithic to the historic period, the non-occurrence of the pit house since early times in North America would be an anomolous situation. There is every reason to believe when a Folsom, or any other early man, habitation site is discovered the domiciliary structure will be the semi-subterranean house.

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University of Wisconsin
Madison, Wisconsin
September, 1951

# THE FALLIS SITE, ONTARIO

FRANK RIDLEY*

THE FALLIS village site is an area of some 4 acres, situated on Lot 2, Concession 4, in the Township of Tiny, Simcoe County, Ontario. Springs at the site are the source of a small stream, which joins the River Wye at the head of Mud Lake. At the foot of this small lake are the ruins of Fort St. Marie (Kidd, 1949) built in the opening decades of the seventeenth century, as the center of activities of the unfortunate mission of the Hurons. Thus the Fallis site is situated in the heart of the historic Huron country.

In A. F. Hunter's work (1899, p. 38), the site is listed as No. 38, "John Fraser's and William Smith's," with the information that the author casually inspected the site and found fragments of pottery scattered about. Hunter does not report European goods at this site, nor does he say whether it had been cultivated.

In the course of re-examining some of Hunter's listed sites, I visited the site. In a preliminary test, I removed a square yard of sod, and then the black soil in layers, until the undisturbed sand was reached at a depth of fourteen inches. Artifacts found belonged to two separate groups. In the upper part pottery and other artifacts appeared, similar to those from contact Huron sites in the locality, and in the lighter colored ash underlying, were potsherds and other artifacts that matched material from the Lalonde group of sites in the same area. Indications were that the site was a stratified one which had been occupied by the two separate cultural groups. It seemed that further work at this place might help in solving chronological problems respecting pre-Huron occupation.

Only a small part of the village site is in the open and could be trenched. The largest part of the site is covered by a thick growth of a reforestation project which is fenced off from the open portion. So thick is this pinery, that the limit of aboriginal occupation is difficult to ascertain. The village size was therefore only roughly traced by observing the extent of the

*Editor's Note. This article is closely keyed into Ridley's article, "The Huron and Lalonde Occupations of Ontario," *American Antiquity*, Vol. 17, No. 3. Because the two articles fall into different volumes, the critical figures of the first article are here reproduced on a smaller scale for convenience in reading, but reference to the first article will perhaps be necessary for critical analysis by area specialists.

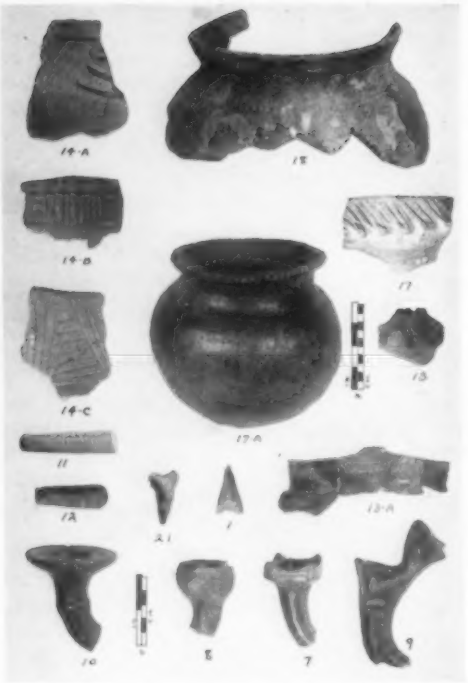

FIG. 1.

black deposit. In the pinery there are ash-heaps deeper than that to be described in this report.

The ground at the site falls away gradually toward the south with a steeper slope just at the springs, and rises gently to the north until reaching an additional 100 feet in elevation at the top of a distant ridge. The sand is loose and rather sterile. It supports only a thin mossy turf and a few deeply rooted weeds. Longitudinally at right angles to the fence line, and extending from the wet ground to the fence, an area 10 feet wide by 110 feet long, was staked in 5 foot squares. The contents of 9 of these squares provided the data for this paper (Fig. 5).

The excavation was started at the lower edge of the site with a trench 2½ feet wide, and proceeded uphill to square 25 without encountering artifacts or post molds. Digging was widened to 10 feet at square 25, revealing a few Lalonde potsherds. Similarly squares 30 and 30L1, yielded a section of body decorated vessel of Webb-Lalonde design, trait 31, and a complete Lalonde pipe complex. Squares 35 and 35L1, continued the production of Lalonde types with an admixture of Huron-like basic rim sherds.

A pot ear, trait 13, and a decorated pipe-stem, trait 11, found in the upper level of square 40L1 marked the lowest incidence, geographically, of definite Huron refuse on the slope of the site. From this point upward to the habitation area, a predominately Huron refuse layer is superimposed on a shallow, practically unbroken layer of Lalonde refuse.

In square 40L1, level 2, was found a pipe that is only familiar to me in other collections, and was therefore not included in the trait list (see Fig. 2, A). This pipe bowl was rebored above the broken stub of the original stem, for improvised use. All other pipes of non-Lalonde type found on this site had been rebored. The Lalonde vessel, trait 23 (Fig. 2, 23) lay on the third and lowest level of square 40.

FIG. 2.

Three quarters of square 45 were taken out in the test dig, that material having been marked, "Upper" and "Lower," and not entered on the Fallis depth table. The remainder of the squares 45 and 45L1 aptly illustrate the imposition of the later occupation. The rare whole rectilinear pipe (Fig. 3, *E*) was found at the lowest level (see Fig. 5). The handsome vessel with the shoulder castellation (Fig. 2, *16*) was recovered from square 45L1, level 3. Since this shoulder ornament is a contact Huron trait, and several others of the type appeared in this Fallis work, it was highly satisfactory to learn of the vessel to which they belong. Pitted hammerstones and the restored vessel (Fig. 2, *13B*) were in level 3, square 40. The vessel lay in fragments in the left north corner. Found also in level 3 was the redrilled pipe (Fig. 2, *B*) somewhat resembling that from level 4 in square 40. Material of Lalonde type continued below level 4.

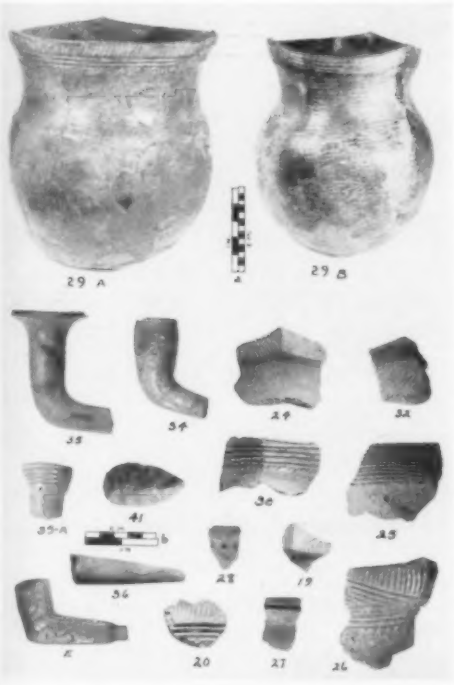


FIG. 3.

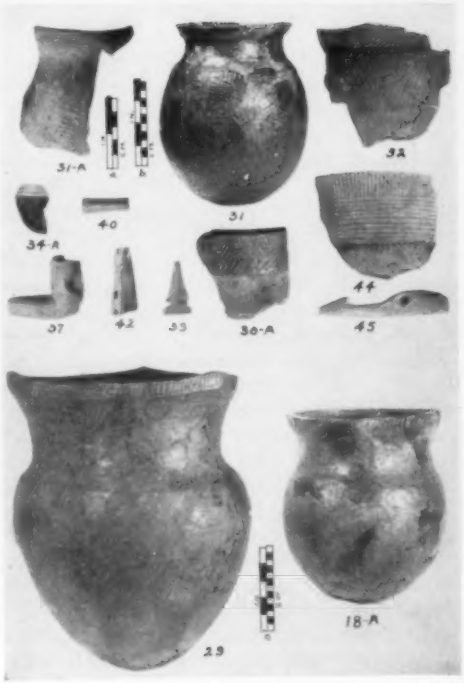


FIG. 4.

From square 50L1, came part of a contact Huron crow effigy pipe that lay in level 2, a part of a Lalonde trumpet pipe in level 3 and the human effigy pipe bowl (Fig. 2, 9A) in level 4. Lalonde type material was scarce in the low level, but there was a pot rim sherd which fulfilled the definition given for trait 20.

A flat anvil stone, 15 cm. in diameter, was in level 2 of square 55. A single rim sherd of trait 23 was found in level 3, as well as two rectangular beads of cut mammal jawbone, several bird bone beads and a perforated bear tooth. This square was much disturbed. Throughout were sand lenses and pockets, and beneath the ash, post molds arranged as if they had formed part of a circle.

In the first level of square 55L1, were small Huron pieces. In the second level was a small circle of hearth stones which occupied the right lower corner and extended into level 3. In conjunction with the hearth were numerous bones of small mammals, pockets of fish bones and scales, the sacrum and a few other bones of a child. The levels below contained isolated

sherds of both Lalonde and Huron types, and directly under the hearth was a post mold. The mold is in such a position that it continues the circle of molds found in square 55.

Level 2 of square 60 provided a rebored broken pipe fragment, a human tooth and the three-handled, restored vessel (Fig. 2, 13C). Large sections of other vessels of apparently similar design and workmanship to that restored were found in the right north corner. Otherwise this square was rather confusing, since odd sherds of Lalonde pottery appeared in the top layers. Two post molds were found, in line crossing the square at the center.

Square 65 gave definite Huron pottery on the first level, the same and disintegrated Lalonde types in the second and third levels. Level 4 had definite Lalonde pieces and showed a row of post molds running perpendicular to the line of the trench.

It is evident that a twice occupied site, such as Fallis, does not always show a clear line of demarcation between deposits. Apparently the last occupants gouged and disturbed the older deposit by digging holes for various reasons. This activity brought odd pieces from below to the upper strata, but fortunately left sand lenses to mark the disturbances. Nowhere, however, did the typical late material occur in the lowest layer. By the examination of other parts of the site, I found that the two occupations do not always contribute to a common midden, nor is occupational dirt consistent in depth for either.

It was possible to assemble several sections of Huron pottery from the same level and square. This happened several times at various places along the trench, where the fragmentary vessel sections, while of separate pots, seemed to bear the mark of common craftsmanship and design. They seemed as if together by virtue of a house cleaning. In addition to four restored vessels, there are many large restored fragments. These latter give an interesting picture of pottery technique to the eyewitness, but space prevents their illustration. These are all counted on Figure 5 where they are listed under the corresponding trait; traits are exemplified in Figures 1-4.

The shape, thickness, texture and color of the vessels and sherds from the upper levels of the Fallis site, are identical to contact Huron ware. In inventory and ornament detail there is some difference, since the Susquehannock High Collar, trait 14, and the pinched collar, trait 17, are missing. The Huron flat top ear is present in a narrower form with less notching across the lip. Many of the ears have the

FALLIS PREHISTORIC VILLAGE SITE.

STRATIGRAPHIC OCCURENCE OF ARTIFACT TYPES IN CERTAIN RECTANGULAR AREAS OF EXCAVATED TRENCH.

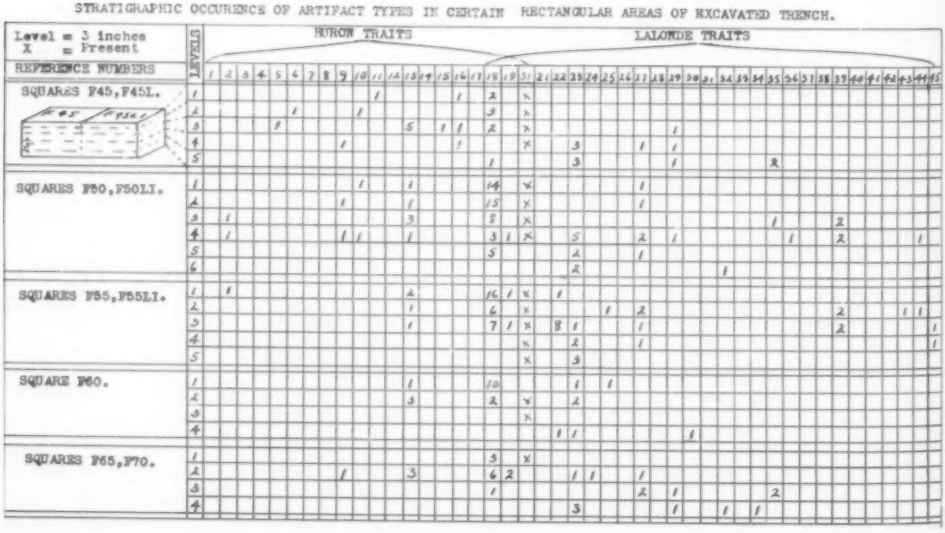


FIG. 5.

centered vertical incision so pronounced that the ear is split (Fig. 2, *16*). Much of the incising on Fallis upper level pottery is broad and smooth, as if executed with a rounded tool, whereas the contact Huron ware has a predominance of narrow furrowed incising.

Absence of imports, such as conch shell and red catlinite stone, and the reboring of pipe bowls, suggests a restricted economy. The total absence of the castellated pipe, trait 7, and the acorn pipe, trait 8, both so numerous on contact Huron sites, and the substitution of the pipe style illustrated (Fig. 2, *A, B*) needs clarification. This pipe style and the vessel shoulder castellation appear in Wintemberg (1946). The pipe style is known in collections from the Huronia district and Victoria County, but excepting Wintemberg's, I am not aware of any with known associations. It seems to be an early development of the Huron castellated pipe, as most of them have the fundamental ornament in the four slots and the horizontal incising. The shoulder node I have found on prehistoric Iroquoian sites in Victoria County, and only once on a contact location. A shoulder node is illustrated from the Roebuck site (Wintemberg, 1936).

The Iroquoian effigy crow pipe, bird pipe, and the one illustrated (Fig. 2, *9A*), together with the restored vessels and non-illustrated fragments, amply demonstrate the high aesthetic development of the Fallis Huron. Nevertheless in view of the discrepancies and additions, a time distance between these people and the final occupation must exist. The proper information is probably still buried in the lower ash layers of the major contact Huron sites.

On a typical location, the Fallis Lalonde manifestation includes the majority of known traits of that complex. The whole rectangular pipe (Fig. 3, *E*) may introduce a new trait, since incised rectangular and nippled stems have been found on early sites and on sites of unknown age elsewhere in central Ontario. The chronological position of the Fallis Lalonde occupation, sometime before a prehistoric Huron occupation, is of major interest. Otherwise this product is subservient to the identity of the Lalonde group as a whole.

In a study of the distribution of Lalonde type artifacts the following instances were recorded: In the Martyrs Shrine Museum, Midland, as an example of the effect of French influence on prehistoric Huron, is a collection of Lalonde artifacts evidently recovered from a pure Lalonde site. In an adjoining case is a collection of typical contact Huron artifacts. In contrast to the drab Lalonde pipe complex, the contact Huron collection is resplendent with effigy pipe bowls. The two groups of artifacts are from separate locations in Huronia.

In the Flanagan Farm report, Jury (1948) illustrates a rectangular, nippled and decorated pipestem that seems related to that from the lowest level of the Fallis site (Fig. 3, *E*). He reports the presence of clay discoidals, a trait lacking at Lalonde sites by the writer's experience. Otherwise, the Flanagan occupation appears to be Lalonde. In describing a site in the Township of Medonte, A. F. Hunter (1902) wrote, "Nearly all the clay pipes found at this site are of a noteworthy pattern. Clay pipes bearing this design or pattern—a belt of grooves around the top of the bowl with a line of dots underneath them—are common on the village sites in this part of the township, and on sites all the way to Barrie and even further south. For the sake of convenience I will call this style the Belt pattern." Later in the same publication, Hunter returns to the subject, in which he expresses hope that future research workers will probe into the strange difference.

The Smelser-Orr collection of the Royal Ontario Museum of Archaeology is from York County, near Toronto. The barrel and trumpet pipes of Lalonde pattern dominate the collection. The high collar rim sherd (Fig, 2, *23E*) has been selected from this collection. The Dunn collection of the Royal Ontario Museum of Archaeology is quite similar to the Smelser-Orr. The high collar rim sherd illustrated (Fig. 2, *23G*) is from the Dunn collection. These collections also have other Lalonde pottery types including that illustrated (Fig. 4, *32*). Easterly from Huronia, the Voutt site yields Lalonde types; the high collar rim sherd illustrated (Fig. 2, *23A*) is from the site. I have visited Laidlaw's Victoria County site No. 9 (Laidlaw, 1912), but found no artifacts of any kind. The present Mr. Trueman, whose father collected for Laidlaw, described a typical Lalonde complex as the type of material that was recovered from this site. In the Royal Ontario Museum of Archaeology is a box of assorted barrel and Lalonde trumpet pipes, gathered from a site near Bastiste Lake, Hastings County. Bastiste Lake is about 120 miles east of Huronia. In the museum collections

there are also two groups of assorted barrel and Lalonde trumpet pipes from Prince Edward County. Merrill (1912, p. 77) also illustrates rim sherds from Lalonde vessels from Prince Edward County.

Across Nottawasaga Bay, a westerly direction from Huronia, lies the ancient land of the Petun, or Tobacco People. From this area, now called Nottawasaga Township, the Royal Ontario Museum of Archaeology has received many pipes of the Lalonde type in addition to those of the fantastic contact Iroquoian pattern. Unfortunately, very little pottery was included with the early collections, so the pipe is left as the principal indicator of the presence of Lalonde-like people.

At the Sidey-Mackay site in Nottawasaga Township, Wintemberg (1946) reported finding 5 typical barrel pipes and 3 finely made undecorated trumpet pipes, with a total of 223 pipes found. Since a few pot rim sherds of Lalonde pattern were found, the possibility of stratification exists at the Sidey-Mackay site. One hundred and twenty miles from Huronia, near London, Ontario, is the Lawson site (Wintemberg, 1939). Six rim sherds from the Lalonde site match cuts in the Lawson publication, as if they were originals. The finely tapered pipestem, the barrel and trumpet pipes, plano-convex scrapers, were found on the Lawson site in good number. There are features negative to Lalonde, such as earthworks, the Iroquoian decorated pipestem, effigy pipe, shell ornaments and many decorated sherds like some from the Wolf site in Michigan (see Greenman, 1939). Missing in Lawson is the classic Lalonde high collar rim.

Prior to his work at Lawson, Wintemberg (1929) illustrated barrel and trumpet pipes from several sites north of Lake Erie. Wrote Wintemberg, "The stems of most pipes with trumpet or barrel shaped bowls have long and more or less slender stems. Others have stems of medium length, which taper rapidly from where they join the bowl to the tip."

Recently G. D. Bell of Binbrook, a village south of Hamilton, very kindly showed me artifacts found in that locality. Bell keeps his material rigorously segregated and cataloged, and includes everything found on his sites. His Guyatt site is a shallow deposit that has produced the rolled rim, a rectangular nippled undecorated pipestem, a variation of the Lalonde high collar rim, Lalonde pointed castellation, notched and non-notched small triangular points, the Lalonde pipe complex and no European material. The Wood site was also a shallow deposit and from it Bell recovered Webb Common, a typical Lalonde pointed castellation, the Lalonde pipe complex, and metal of European origin. This last feature is non-typical, since the combination appears at no other site to my knowledge.

Mr. J. Smith of Mt. Hope and Mr. Steele of nearby Hamilton, have kindly shown me their collections. Smith has many examples of Lalonde barrel and trumpet pipes, all collected from prehistoric sites in the Neutral area. Steele showed me the same pipe complex, slightly modified, that came from the Clairville site. The Clairville site is a few miles east from Chatham, Ontario.

These above instances of occurrence, taken with the author's work, suggest the Lalonde complex to be a heavy prehistoric Iroquoian occupation that once covered a considerable portion of Ontario. Does a parallel condition obtain in the State of New York? In 1922 Parker wrote, "Most writers have observed that there are few places where Iroquoian artifacts are found unmixed with evidence of contact with the European. The few early sites of pre-colonial occupation . . . differ but slightly from those of a later date." Ritchie (1944), in an introduction, adds little to Parker's Iroquois work, so I assume there is no definite occupation between the Iroquois and Owasco groups of New York.

The occurrence of artifacts similar to contact Huron was also studied. J. Smith of Mt. Hope has collected, from contact sites and contact ossuaries, the following: The effigy bird pipe, the castellated or Huron pipe, the twisted pipestem of black ware, center holed needle of bone and European copper, all identical with contact Huron types. The numerous iron axes associated with these articles are identical, and possess the same trade marks as those found on contact Huron sites. These Indian artifacts are locally termed Seneca. Steele's collection is quite similar, with the curious addition of a leaf shaped brass pot lug that duplicates one I have from Ossossane. There is also a magnificent display of beads, both Indian and European, similar to those found in Huronia. Steele has, in addition to the contact Huron pipe varieties, a complicated effigy pipe from Nottawasaga Township, that exactly duplicates one

illustrated by Beauchamp (1898, pipe No. 210) as from Genesse County, New York. These Indian artifacts, recognized by the writer as Huron, appear in the Seneca area of New York state.

## CONCLUSIONS

Many students of northeastern archaeology seem disinclined to separate a prehistoric Iroquoian manifestation from the historic tribal terminology of the common area. This is a conclusion based on the assumption of a shallow time depth for Iroquoian occupation.

In Ontario, certain vessels of the Point Peninsula focus, Woodlands pattern, carry several of the fundamental Iroquoian pottery designs. For example, the Psuedo-Scallop Shell vessel, marker type of the Point Peninsula People, has in succession starting at the lip: short oblique lines, horizontal annular lines and finally, body chevrons, the latter outlined with a complicated stylus. This is a decorative pattern that is found on Iroquoian stations up to the contact period. Recently, radiocarbon dates of 3000 and 2000 years have been recorded for Point Peninsula. Having deducted time for an Owasco aspect from a radiocarbon average of 2500 years for Point Peninsula, how much time should reasonably be allotted to an Iroquoian development?

In view of the few villages of Woodlands people and the apparently endless villages of varying Iroquoian type, a suggestion of a short development period for the latter would be to presume an enormous stimulus to aboriginal population. Agriculture could be a reason, but the agricultural Owasco people did not multiply to the extent of spreading any appreciable population north of Lake Ontario. For these reasons, a supposition of a long period of Iroquoian development is tenable.

The theory that suggested a late migration of the Iroquoian people that came up the Ohio Valley, to settle in Ontario and New York state, seems completely discarded for lack of archaeological evidence. Local prehistoric movements of Iroquoian, such as the migration from Hochelaga to the Mohawk-Onondaga area, and the prehistoric similarities on each side of the Niagara River have been recognized for many years. Griffin (1946) suggested that the Iroquois complex developed in the lower Great Lakes area from a Woodlands background. This idea is shared by Ritchie. It was a search for origins of New York Indian types that prompted Ritchie's recent work in Ontario.

* * *

Let us now examine the possibility of developing a Lalonde focus which can be fitted into the story of Iroquoian development. A Woodlands population, centered north of Lake Erie and Lake Ontario were possessors of the concepts of Iroquoian pottery. Unpublished material in the writer's collection suggests these Woodlands people developed a push-pull pottery decorating technique from their linear punctate pottery style, and relegated embossing, stamping, and cordmarking to a minor quantity. This push-pull complex evolved into a flourishing incised and trailed line pottery technique that can be designated Iroquoian. Collections in the Hamilton, Grand River area are rife with the material. Nonetheless the pottery still carries a minor quantity of the earlier traits, such as shell edge incising, stamped lines, checkstamp, body roughening and conoid base. The pottery of these people also contains, in great contrast, the first definite intrusion of shape and ware technique of the aboriginal development of the Mississippi Valley (Ritchie, 1946). The Uren and the Webb sites illustrate the complex. The writer is confident that this occupation is ancestral to the proposed Lalonde focus.

That the Lalonde people flourished and expanded, continuing the use of ancestral pipe and pottery types and developing their high collar pottery, is attested by numerous village sites they left. It is probable that the Lalonde focus was undergoing ever increasing influence from the changes of the Mississippi Valley. In pottery this would tend toward a globular, short necked vessel of thin, well fired ware. Iroquoian sites in Prince Edward County, and the material illustrated from Roebuck both suggest that this influence affects the Lalonde artifact complex. This also suggests an eastward migration from the Lalonde population center. As the migrants moved further from the Mississippi influence the artifacts were little changed as they continued around the foot of Lake Ontario toward New York state. Such an invasion of Lalonde people into New York would be the foundation of the historic Eastern Iroquois. The trumpet pipe, of smoothed light brown ware, and the basic high collar vessel were not discarded by the Eastern Iroquois.

The idea of high collar, together with its basic decoration traveled southerly to the valley of the Susquehanna River.

That the Eastern Iroquois were invaders of New York state, is suggested by their earthworks, a feature lacking in the Iroquoian sites in central southern Ontario.

Returning to the Lalonde center in Ontario, we find the closer Mississippi influence continuing over a long period until it nearly overwhelmed the ancestral artifact types of the Lalonde focus. The once dominant high collar disappeared unless the contact Huron flat top ear with its incised lip is a remnant. A large quantity of effigy and modeled pipes were introduced from an unknown source, and very little of the old Lalonde pipe complex survived. The sole survivor seems to be the ringed acorn pipe, upon the bowl of which is the Lalonde barrel annular line and punctate decoration.

For some unknown reason another movement southerly into New York state began. This was over the Niagara River. These migrants, being invaders, also built earthworks on their village sites. Ultimately the intruders crystallized into the Seneca, Erie and Neutral divisions. Remaining in the old Lalonde homeland were the northerly Neutrals and the Hurons.

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R.R.I. Islington,
Ontario.
June, 1951.

# IMPLICATIONS OF RADIOCARBON DATINGS FOR THE ORIGIN OF THE DORSET CULTURE*

BERNARD G. HOFFMAN

SINCE ITS DISCOVERY by Jenness in 1925, the Dorset culture has presented students of Eskimo archaeology with a persistent problem. Apparently representing an Arctic land-hunting culture, centering in the eastern Arctic, and containing many cultural items also to be found in more southern Indian cultures, the Dorset culture has presented ample opportunity for conjectural reconstructions of its origins and affinities. Mathiassen, who collected Dorset materials from Bylot and Southampton islands, first considered Dorset merely as a localized and specialized phase of the Thule culture (Mathiassen, 1925, part 1, pp. 206-12, 258-60; part 2, pp. 164-65). Later, however, he came to regard Dorset as non-Eskimo, and as a culture both influenced by, and influencing, Thule (Mathiassen and Holtved, 1936, p. 130). Jenness originally regarded Dorset as a paleo-Eskimo form of the proto-Eskimo culture of the Arctic Interior (Jenness, 1933, p. 365), but later shifted to the viewpoint that Dorset was a genuine Eskimo culture—albeit showing some Indian influences—which was distantly related to the cultures of Western Alaska (Jenness, 1940, p. 9). That this was the case has been repeatedly assumed as proved by de Laguna (1946, p. 106; 1947, pp. 13-14, 284-85).

Proceeding from this identification of Dorset as an Eskimo culture, numerous students have discussed the "Eskimo Dorset" elements appearing in the early cultures of the northeastern area of the United States, and in some cases have attempted to characterize these cultures as being "Eskimo" or "Eskimo-like." The traits usually assumed to be diagnostic, and therefore suitable for such reconstructions, include: triangular, concave based arrowpoints; semilunar knives; bone combs; double-edged slate blades; soapstone plummets and pots; Dorset-type bone harpoon heads; leisters; and bone needles (Strong, 1930, pp. 136-41; de Laguna, 1946). In the absence of temporal perspective with respect to the various occurrences of these cultural items, the north-to-south diffusion of such elements seemed reasonable, and was allowed to remain unchallenged.

The recent radiocarbon datings (Johnson, 1951) of the early cultures of the northeastern United States, and of the Late Wisconsin period in North America, combine, however, to render such a reconstruction extremely improbable, and force us to view these cultural remains in an entirely new light.

The early northeastern cultures showing Dorset-like manifestations include the Old Copper culture of the western Great Lakes region (McKern, 1942, pp. 167-8; Martin, Quimby, and Collier, 1947, pp. 299-303), and the Lamoka, Frontenac, Laurentian, and Point Peninsula cultures of New York (Ritchie, 1944, pp. 121-86, 235-310); the manifestations in these cases including notched tang points, semilunar knives, bone and copper Dorset-like harpoons, bone combs, and plummet stones. Now, as the result of recent developments in radiocarbon dating we can arrange these cultures in an absolute chronological sequence, and can correlate them with geological events. This absolute sequence agrees with the previously established relative datings, and receives indirect support from the datings determined for the early cultures of other areas.

Turning to the dates themselves—for Lamoka we derive an age of about 5400 years, and for Frontenac, 5000 years (Johnson, 1951, Table 1, samples 191, 367). From indirect evidence we may give Laurentian an age of about 3000 years (Ritchie, 1951, p. 31).

Proceeding now to the datings for the various events of the Mankato, we find the Mankato maximum to have occurred 11,000 years ago (samples 308, 365, 366, 536, 537). In collaboration, we find the Boreal to have existed 10,000 years ago in West Virginia (sample 336), 7000 to 8000 years ago in Wisconsin and Connecticut (samples 334, 332, 122), 6000 years ago in Maine (sample 335), 5000 years ago in Indiana (sample 500), and 3000 years ago in western Alberta (sample 606, see Flint and Deevey, 1951, pp. 271-4). We also have a dating of 7000 years for a glacial drift near Menasha, Wisconsin (sample 419, Flint and Deevey, 1951, pp. 281-2). For the post-Man-

*Since this paper was written, Ritchie's article "Ground Slates: Indian or Eskimo?," *Pennsylvania Archaeologist*, Vol. 21, No. 3, 1951 has appeared. Ritchie's conclusions agree with those of this paper, although the problem was approached differently.

kato period we have a dating of about 5000 years for the termination of the Late Algonquin III phase of the glacial Great Lakes (sample 191), as well as two samples dating the Nipissing Great Lakes at about 3000 years (samples 364, 504).

Let us now turn to the associations which have been implied between the late glacial stages and the early cultures of the northeastern area—specifically, let us consider the situation at the time of the Frontenac Island culture. The material used for the radiocarbon dating here derived from the deepest refuse levels of the site (trench 4, section 4), being found in a hearth which was intrusive into a light brown clay subsoil which was deposited when the island was submerged by Lake Iroquois during the Lake Algonquin III stage. According to Flint (1951, p. 55), the lowering of this lake level marked the end of this Algonquin III phase—which event Flint dates by assuming "that the site was occupied shortly after emergence." While we may, perhaps, question the validity of this assumption, the dates for the Nipissing Great Lakes phase indicate that the Frontenac culture was almost certainly coeval with the Lake Algonquin IV phase.

If, now, the geological reconstructions of the Algonquin IV phase of the glacial lakes is correct, this was a period during which the shrinkage of the glacial sheets opened successive new outlets eastward from Lake Algonquin across the highlands east of Georgian Bay to the Lake Ontario basin. Eventually, a new outlet developed leading from North Bay, Ontario, down the Mattawa and Ottawa River valleys to the St. Lawrence valley. Thus, in Algonquin IV times the glacial sheet still seems to have extended to within a short distance of the Great Lakes basin, and to have formed a barrier on the upper Ottawa drainage area. At the same time, its westward extensions impounded Lake Agassiz (Thwaites, 1941, pp. 87-8; Flint, 1947, pp. 254-67; and Flint and Deevey, 1951, pp. 283-5).

If these radiocarbon datings are correct, at least in the relative sense; if the geological correlations between the various glacial stages and phases are valid; and if the implied existence of a glacial sheet in close proximity to the Great Lakes during Algonquin IV times can be confirmed, it is then difficult to see how the Dorset-like manifestations of the early northeastern cultures can derive from the north. Unless one postulates the existence of a people able to subsist on top of an icecap, one is faced with the alternatives of (a), deriving the Dorset elements from the west or southwest, or (b), explaining them as originally deriving from the northeastern area. Thus, they may represent an arctic tundra and glacial lake culture of considerable antiquity in eastern North America. This culture may have moved northward with the waning of the glacial sheets and the retreat of the tundra into the northern sections of the Labrador Peninsula, and may have occupied Baffinland from there. This latter explanation would account for (a) the early manifestations in the northeastern cultures, (b) their distributions in the northeastern region from Wisconsin to Newfoundland, and northward, and (c), the apparent absence of early Dorset in Alaska. This explanation does not, however, easily explain the presence of the semilunar knife in the northeast and its absence in the Dorset type sites. It is possible that this trait indicates diffusion from the Alaskan region southward to the Great Lakes area, or vice versa.

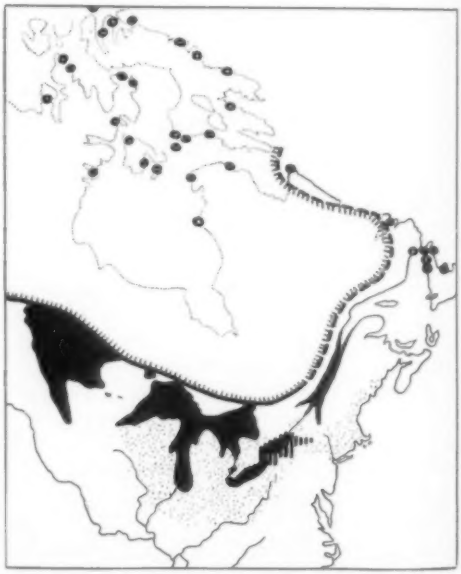

FIG. 6. Map of northeastern North America showing the glacial conditions during the Lake Algonquin IV phase. The extent of the glacial sheet (conjectural in the east), the extent of the glacial lakes and seas (solid black), the location of the Lamoka culture (heavy vertical lines), the location of other early cultures showing Dorset-like manifestations (stippling), and the location of the Dorset type sites (circles) are indicated.

Whatever the final explanation of this situation may be, it seems that, *if* the implied correlations between the early cultures and the late Wisconsin glacial stages are correct, the hypothesis of a diffusion of Dorset from the eastern Arctic area southward is rendered untenable. We are required to explain the apparently much greater antiquity of Dorset-like traits in the northeast than in the northwest. This will require a complete reconsideration of the Dorset problem, and probably a revision of the definition of the "Dorset culture."

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# POTTERY FROM HOOPER BAY VILLAGE, ALASKA

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ARCHAEOLOGICAL excavations along coastal Alaska from Cape Prince of Wales south to the Alaska Peninsula, a distance of approximately 2000 miles, were not initiated until 1948, when Giddings (1949) began work in the north at Cape Denbigh, and Larsen (1950) began at Bristol Bay in the southern section of this great area (see Fig. 7). During the summer of 1950 the writer carried out excavations at Hooper Bay, in approximately the center of the unworked region.* Although the Hooper Bay Village material includes about 2000 artifacts and 1500 pot and lamp sherds, this paper is limited to a preliminary analysis of the cooking pots. The importance of pottery in determining the sequence within Eskimo prehistory has been neglected, in the face of the abundance of organic material which the frozen middens and house remains yield. The full significance of Alaskan pottery was not emphasized until de Laguna (1947) made her detailed study of the ware; also, Larsen (1950, p. 186) pointed out that potsherds are particularly good time indicators in a region like southwestern Alaska, where the preservation is poor. In this paper the Hooper Bay sherds are considered with particular reference to their position within the Bristol Bay-Norton Sound region and their relationship to finds of similar pottery in the north.

Hooper Bay lies beyond the timber line between the mouths of the Yukon and Kuskokwim rivers; except for the Askinuk mountains, 2300 feet in elevation, to the north, the region is low, marshy, and covered with silt. The area is dissected by innumerable sloughs, rivers, lakes, and ponds; these make it virtually impossible to travel by foot more than a few miles in a straight line. The bay itself and the adjacent sea coast are quite shallow; when the 7 to 9 foot tide is out, it is impossible to travel by water even with a shallow draft boat. Hooper Bay Village is located at the northern end of the bay on a small slough that flows through Hooper Bay into the Bering Sea. The village is built upon three knolls, one behind the other, with only the first fronting the slough. Upon historic contact, dwellings were on the first knoll only; the remaining two knolls were covered with burials. Today, however, there are dwellings on all three knolls, with a Catholic Mission and a native store occupying most of the second, and the Alaska Native Service school the third. The knoll fronting the slough measures approximately 380 by 150 by 50 feet; this is the only section of the village where evidence of prehistoric houses and midden was found. Midden debris is present all along this natural mound and is more than 15 feet deep in the thicker sections. Still accumulating, the deposit has already become one of the larger middens in western Alaska. Since most of the midden is covered with present day houses, the space in which to dig was limited; however, two test cuts were marked off; one, 36 by 36 feet, was on the east end of the midden and a smaller one, 6 by 18 feet, at the other end of the midden. When excavations were begun on July 7, the ground had thawed to a depth of slightly more than two feet; after this layer had been removed, the thawing progressed less than two inches per day. By August 28 at the end of the field season, depths of 5 and 8 feet had been reached in the larger and smaller test cuts respectively.

The manufacture of pottery is still remembered by the older inhabitants of Hooper Bay Village; the process was described to the writer by Alec Smart, a man in his seventies and the oldest person in the village. He stated that although a little pottery clay came from the north side of the nearby Askinuk mountains, the greater percentage was from Nelson Island. Clay used in vessel construction was moistened with water and mixed with crushed rock into a paste. It also was mentioned that dog hair and manure could be mixed with the rock. The pot bottom was constructed from one piece of clay, with little pieces pressed onto the bottom to form the sides. If the vessel was to be decorated, the designs were then made

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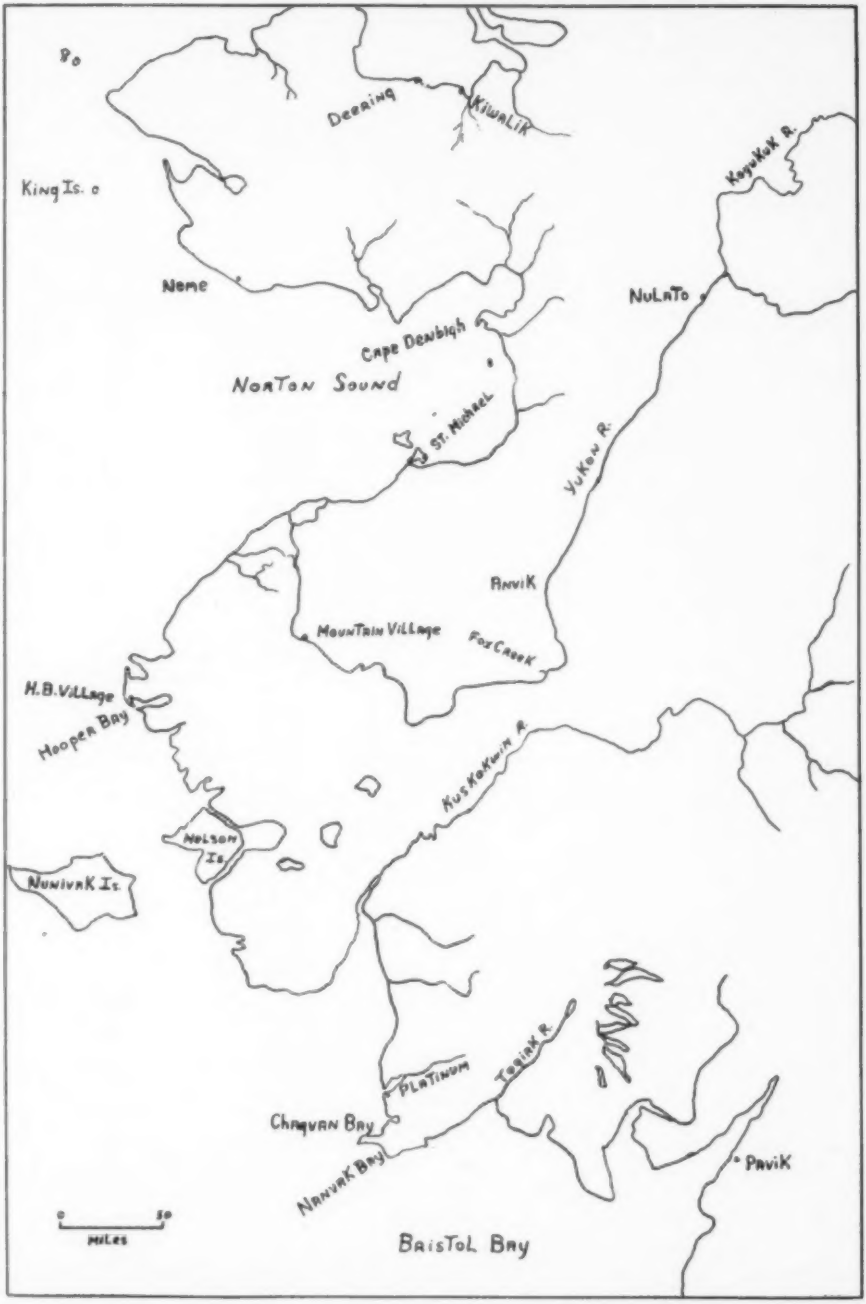


FIG. 7. Map of the northwest coast of Alaska.

by using a piece of either bone or wood. The pot was allowed to dry in the open air for a short while before it was placed in a hot fire; after sufficient firing, it was cooled. Next, old seal oil was smeared on the vessel to blacken it, and once again it was fired and cooled; if the pot then held water it was considered good. Pottery making, according to Mr. Smart, was the work of only the old women.

Cooking pots found at the Hooper Bay site are of two forms: Type 1, represented by 7 large sherds and one fragmentary pot, is flat-bottomed with sides that flare evenly, or flare and constrict to the neck, with an additional outward flare at the rim (Fig. 10, *2-5*). In cross section the vessel lips are flat (3 sherds), flat and sloping outward (3), rounded (1), or Λ shaped with an outward bulge (1) (Fig. 10, 5). There is a suspension hole in one sherd; in each of 2 sherds there are a pair of mending holes. Five sherds are undecorated and 3 have incised designs. Type 2, represented by 4 undecorated sherds, is flat-bottomed with straight or slightly flaring sides (Fig. 10, *1*). The lips are either flat (3) or rounded (1) in cross section. One sherd has two suspension holes, both of which still contain bits of grass line; a hole in another sherd is probably for mending. Pots with rounded bottoms appear to have been absent from the Hooper Bay site, where 4 complete flat vessel bottoms (Fig. 10, *7-9*) and 65 flat-bottomed sherds were recovered. Since the collection of 1400 sherds did not yield a single round-bottomed fragment, the above vessel types have been classed as flat-bottomed.

Lip sherds too small to allow a reconstruction of the vessel shape total 224 and are from nearly all levels. In cross section the lip sherds are flattened (100), flat and sloping out (20), flat and in-sloping (13), flat with an incised line on the top (9), rounded (77), and Λ shaped with an outward bulge beneath the lip (5). Each of 21 sherds, from pots of undetermined form, has one or two holes in the side. The holes on 5 of these sherds are suspension holes near the rim; 9 are mending holes. Whether the holes in the other 7 sherds are for suspension or whether they are for mending is uncertain. Six of the sherds also have strands of grass in the holes.

The reconstructed size of the cooking pots is based upon one fragmentary vessel, the basal diameters of 4 pot bottoms, and the shape of the large sherds. The type 1 pot complete enough for reconstruction stands 19 cm. high, has a diameter at the mouth of 21 cm., a basal diameter approximately the same as that of the mouth, and an average thickness of 8 mm. The flat-bottoms without sides measure 17, 15, 12 and 10 cm. across, all considerably smaller than the above pot. It would seem, to judge from these bottom sherds and the larger sherds in the collection, that the type 1 reconstructed vessel is somewhat larger than average. Although two of the vessel fragments are from much smaller pots than the others, the form of these pots appears to be nearly the same as the type 1 vessel form (Fig. 10, 6).

Of the 1400 cooking potsherds recovered, 93 are decorated. The types of decoration in order of frequency are short striations (40), lines (22), lined bottom sherds (10), zigzag lines (5), lines and dots (10), dots (3), lines with a double V attached (1), a pointed ridge on the side of a sherd (1), and constricted bands (1).

The term short striations designates sherds decorated with fewer than six lines (less than 2 cm. long) in a parallel series (Fig. 8, *1-4*, 8). The design usually runs in one direction on a single sherd; this direction may be horizontal, diagonal, or perpendicular to the rim; in 3 cases the design runs in a number of directions on a single sherd. The vessels are covered to varying degrees with short striations; on 2 rim sherds the design extends down the side of the pot 5 to 10 cm. respectively. Another sherd is decorated to within 5 cm. of the bottom; 3 sherds from near the base of a pot are completely covered with short striations. This design type also has been combined with a single line (2) and a zigzag line (3). It seems likely that the striations were produced by a local marine shell with a ridged outer surface and a scalloped edge (*Clinocardium nuttallii*). The writer has reproduced such striations by drawing, with rapid short strokes, the scalloped edge of this type shell over the surface of moist modeling clay. In the collection there are also sherds (5) with short striations having irregular ridges or cross ridges within, and at right angles to, the regular striations (Fig. 8, 4). The writer has produced this effect by using the shell described above as a rocker over modeling clay, thereby causing the small cross ridges on the shell to become apparent in the negative impression. Upon superficial examination of two sherds it was thought that they had been impressed with a checkstamp paddle; however, the design proved to be two striated impressions, one at a right angle to, and on top of the other, giving nearly the same effect as a checkstamp.

The plain horizontal lines used in decorating the vessels vary in appearance (Fig. 8, *5*, 9). They may be thin and faint (2), broad and flat (4), or rather deep and grooved (16). There are sherds with a single line (4), two lines (7), three lines (7), four lines (2) or two separated pairs of lines (1). One sherd, somewhat different from the others, combines horizontal with short vertical lines (Fig. 9, 6).

There are two types of decorated sherds from vessel bottoms. The first is represented by 5 sherds and the complete bottom of one pot. This type has, on the outer surface, the impression of knotted grass matting, with the knots and twisted strands of grass plainly visible (Fig. 11). The second type, represented by 4 sherds, is somewhat similar to the above; however, the line part of the impression is deeper and there are no traces of knot imprints (Fig. 9, 9).

Four sherds have a pair of horizontal zigzag lines close to the rim (Fig. 8, 6, 7). It is probable that the scalloped edge of a marine shell was used to produce this effect. The writer has reproduced the design by holding the scalloped edge of *C. nuttallii* at a right angle to a piece of modeling clay and then rotating the shell in an arc. One sherd has a modified zigzag line, with the impression deep toward the rim and lighter toward the bottom of the sherd (Fig. 8, 8). It seems likely that a scalloped shell was used to make a deep impression at the top and was then drawn outward toward the user so that the design grew progressively lighter. This too has been reproduced in modeling clay.

Sherds with the line and dot combination usually (7 out of 11 sherds) have one or two horizontal lines with a row of oval or angular dots beneath. The design may be repeated further down the side of the vessel, repeated using only the dots, or not repeated at all (Fig. 9, *1, 2, 4,* and 8). Two of the sherds, with a single line near the rim and a row of dots beneath, have small ridges on the inner surface (Fig. 9, *5*). Three sherds, all from the same pot, have 3 lines near the rim, with irregularly spaced groups of rectangular dots beneath. These sherds also have ridges modeled on the inner surface and a grooved rim (Fig. 9, *1,* 3; Fig. 10, *10*). Another sherd, from near the rim of a vessel, has 3 horizontal lines with a row of dots below and a trailing triangle of 4 dots beneath the row of dots. Still another sherd has, near the rim, a horizontal line with split dots below, followed by a pair of horizontal lines and then 3 sets of vertically arranged split dots; a faint striated impression is present in the lower left corner (Fig. 9, *7*). The fourth sherd, partly covered with caked residue, has 2 pair of horizontal lines with irregularly (?) spaced pairs of dots beneath each of the lower lines.

Six sherds differ in decoration from those described above. (1) Two rows of dots are on the outer surface near the knobbed rim; there are 3 ridges on the inner surface (Fig. 9, *4*; Fig. 10, *11*). (2) A row of oval dots are near the rim; on the inner surface, also near the rim, are 4 grooves and ridges. (3) This sherd is heavily caked with residue, but 2 dots near the rim still can be seen. On the inner surface are 4 horizontal lines near the rim. (4) There are 2 horizontal parallel lines with a double V attached to the bottom line. (5) Across the face of this sherd are 4 horizontal bands, each 2 mm. wide. Each band constricts the outer surface more than the preceding one, but the total constriction is not more than 3 mm. This design suggests that a broad, blunt tool was drawn around the vessel with varying degrees of force. (6) A small lip extends across the surface of this sherd; the lip is about 3 mm. high, and its appearance suggests that it was made by pinching the surface clay together.

All 1400 sherds were examined to determine the type of temper used in their manufacture. The temper proved to be almost exclusively inorganic, the exceptions being 9 grass tempered sherds. The inorganic temper consists of crushed rock and/or pebbles. Considering Eskimo pottery as a whole, the texture of the ware is quite fine, with the rock and pebble tempering distributed uniformly throughout the ware and seldom protruding through the surface.

To determine the thickness of the ware, sherds from all of the levels were measured. The thickest was 10 mm., the thinnest 2 mm., and the average was about 8 mm.

Practically all of the sherds are black or grey-black in color. The exceptions to this are 10 buff sherds, 2 reddish brown ones, and a few that range in color from black to buff on the same sherd.

Cooking pots similar in shape to those found at the Hooper Bay site have been reported south as far as Kodiak Island, north to Hotham Inlet (east of Kotzebue), and inland on the Yukon River. Hooper Bay type 1 vessel shape is flat-bottomed, with either flaring sides, or sides that flare, then constrict to a neck, and flare again at the mouth. A pot of unknown age but having the same general shape was found at Three Saints Bay on Kodiak Island and is reported by de Laguna (1939, pp. 334-43); however, this vessel is from near the extreme southern limit of Eskimo pottery and has a smaller and a more constricted neck than the northern examples of the same type. Heizer (1949) also reports upon the pottery from Kodiak Island and concludes that the vessel form is the modified situla shape. The majority of the vessels that de Laguna (1947, pp. 226-58) found on the Yukon River are recent; those described as situla-shaped are similar to Hooper Bay type 1; one of the pots from Adam's place, illustrated by de Laguna (1947, Pl. 22 No. 5), is of the above type if only the sherds pieced together, not the total reconstruction, are considered. In Kuskokwim Bay at a precontact but recent site, Platinum South Spit, Larsen (1950, p. 180) found pots he described as "flat-bottomed with slightly flaring sides, a rather faint shoulder, and a slightly constricted neck, which flares to the mouth." This type is, as pointed out by Larsen, de Laguna's situla shape. The faint shoulder on the Platinum South Spit vessels makes them appear more similar in shape to the Yukon situla pots than to Hooper Bay type 1. Nelson (1899, p. 201) describes the pots made at St. Michael upon historic contact as being flat-bottomed and having "sides curving slightly until near the top, where they are somewhat constricted and the rim is made slightly flaring." This shape is similar to type 1, as is the same type pot illustrated by Nelson (1899, Fig.

FIG. 8. Hooper Bay Village pottery; *1-4*, short striations; 5, 9, line decorated; 6-8, zigzag lines.

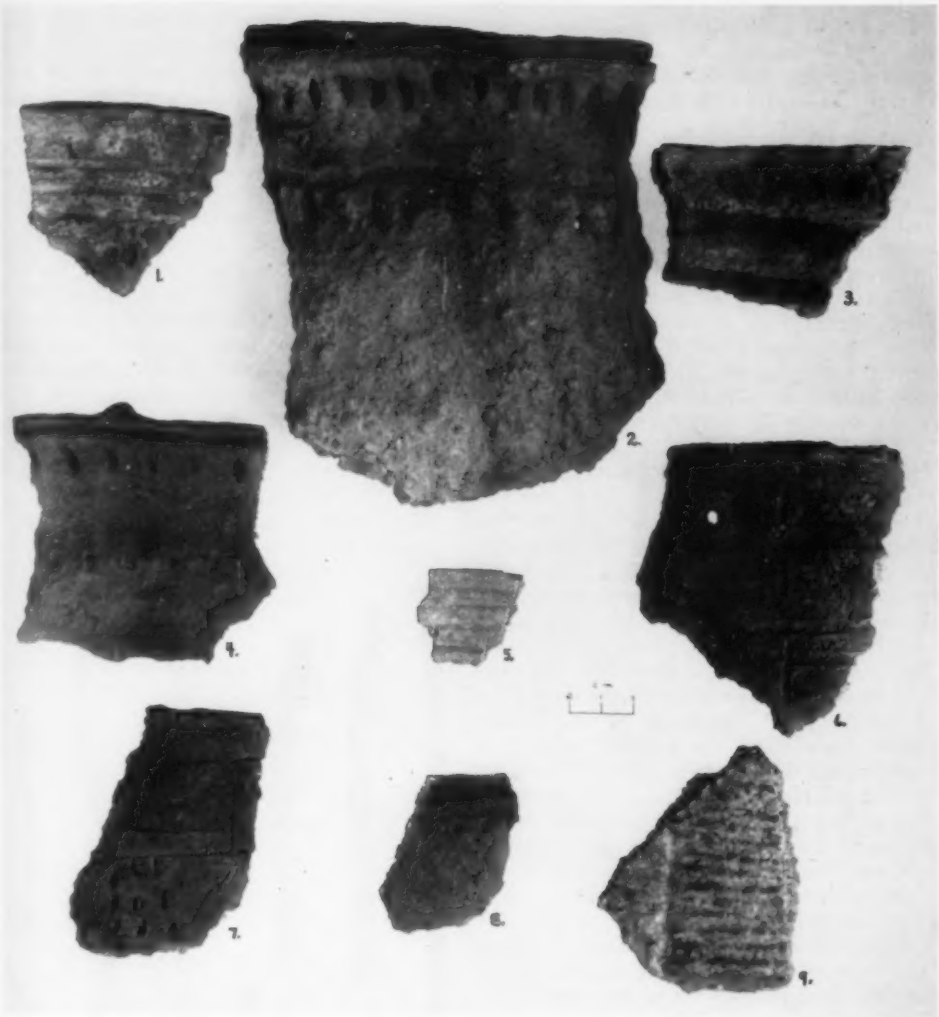


FIG. 9. Hooper Bay Village pottery; *1, 2, 4, 7, 8,* line-dot decorated; *3, 5,* ridged and grooved inside vessel at the rim; *6,* horizontal and vertical lines; *9,* line decorated sherd from vessel bottom.

60) from Hotham Inlet. The latter, however, has a scalloped rim. One of the sherds from King Island, described in the appendix, is also similar to type 1.

Vessels of type 1 or those similar to this type may be plain or decorated and both styles may be found in the same site. The forms of decoration are line and dot (Bristol Bay, Hooper Bay, the Yukon River, and St. Michael); series of short horizontal lines (King Island and Hotham Inlet); striations (Bristol Bay and Hooper Bay); or the absence of decoration (Hooper Bay, the Yukon River, St. Michael, and Kodiak Island). It is noteworthy that the distribution of line and dot decoration is nearly the same as that of the type 1 vessel form.

Type 2 cooking pots from Hooper Bay are flat-bottomed with straight or slightly flaring sides. De Laguna (1947, Pl. 23, 2; Pl. 22, 6) has the same shaped pots from Kateel on the Koyukuk River and from Adam's place on the Yukon River. The pots from Pavik (Larsen, 1950, p. 178), Bristol Bay, abandoned in about 1875, are "plain with a flat bottom, almost straight sides, and a thin rim." An Ipiutak site (Larsen, 1950, pp. 180-3) at Chagvan Bay contained two vessel types similar in form to, but older than, the Hooper Bay type 2; the "thick, plain sherds probably came from large, flat-bottomed vessels with straight sides and a rounded rim," and "thin, plain sherds also belong to the flat-bottomed vessels, but the sides may flare slightly to a wider mouth with a flat or rounded rim." There is a pot from Nelson Island, described in the appendix, similar to type 2 except that the former constricts slightly at the neck. Nearly all of the vessels similar to Hooper Bay type 2 have been reported as undecorated. The only exceptions to this are the Chagvan Bay Ipiutak vessels (Larsen, 1950, pp. 180-3) with checkstamped decoration.

The decorated pottery from Hooper Bay Village includes sherds with 3 distinctive, contemporaneous motifs: short striations, the zigzag line, and lines alone or lines and dots. There are more striated sherds than any other decorated type. Various types of striated ware have been found in Alaska; the form of implement used to apply the design, and, less often, the method of application cause the variations in appearance. Some of the oldest striated Alaskan pottery is from the upper clay layers at Cape Denbigh (Giddings, 1949, Fig. 4); an illustration of this ware shows that the striations are long, and where the imprint has not been confused by one group of lines superimposed on another, there are many parallel lines side by side. In the Ipiutak phase (Larsen, 1950, p. 183) at Nanvak Bay a ware was found that has "horizontal impressions probably made with a cord-wrapped paddle." It is probable that the few straited sherds from the Ipiutak middens at Point Hope (Larsen and Rainey, 1948, Pl. 86, *18, 19*) were paddle impressed; the Okvik and Old Bering Sea striated pottery from St. Lawrence Island (Rainey, 1941, p. 550; Collins, 1937, pp. 166-9) was probably also paddled, as evidenced by the lined pottery paddle found by Collins (1937, Pl. 47, *17*) at an Old Bering Sea site. From the recent site of Platinum South Spit (Larsen, 1950, p. 183) are striated sherds; the lines on these are thought to have been made with a pottery comb. Finally, there is the Hooper Bay ware with striations made by a scalloped shell.

The striated pottery from the older Eskimo sites is often associated with a checkstamped ware. This is true at Cape Denbigh (Giddings, 1949, p. 88), where there are many check-

Fig. 10. Hooper Bay Village pottery profiles.

stamped and a few striated sherds associated together. From the Hillside Okvik site at Gambell on St. Lawrence Island there is a checkstamped lamp fragment along with a few striated sherds (University of Alaska collections); Collins (1937, pp. 168-9) has a single checkstamped sherd and numerous striated sherds from the Old Bering Sea culture on St. Lawrence Island. From Nanvak Bay (Larsen, 1950, p. 183) there is a checkstamped ware and probably associated with it is a striated pot. Another indication that checkstamped and striated pottery were contemporaneous is a pottery paddle from Point Hope, in the University of Alaska collections (M-5314), that has striations on one face and the checkstamped design on the opposite face. Since checkstamped and striated pottery both continue into historic times, it seems only a matter of chance that they have not been associated in a recent site.

The known distribution in Alaska of pottery with one or more horizontal encircling lines, such as was found at Hooper Bay, is limited to the Yukon River and adjacent sea coast. The Hooper Bay and Yukon (de Laguna, 1947, pp. 142-9) line-decorated sherds are quite similar; sherds with one or more groups of lines and ones with two pairs of separated lines were found in both localities. There are 3 sherds from St. Michael (see appendix) with horizontal lines. As de Laguna (1947, p. 145) points out, it is possible that many of the lined sherds are incomplete and the lower part may have contained more lines and dots.

The two different types of imprints on some of the Hooper Bay vessel bottoms are similar to each other in appearance. The bottom decoration of short parallel lines is probably an imitation of grass matting imprint, since the lines are approximately the same length as the distance between knots in the matting (Fig. 9,

TABLE 1. DISTRIBUTION OF DECORATION DESIGNS IN THE HOOPER BAY MIDDEN

| | SIX INCH LEVELS | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1-2 | 3-4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | No data | Total |
| Short striations | 3 | 6 | 2 | .... | .... | 1 | 1 | 1 | 1 | 7 | 5 | 4 | 2 | 33 |
| With cross markings | .... | 1 | .... | .... | .... | .... | .... | .... | .... | 2 | 2 | .... | .... | 5 |
| With plain line | .... | 1 | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | 2 |
| Lines | | | | | | | | | | | | | | |
| One | 1 | 1 | 1 | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | 4 |
| Two | 2 | 2 | .... | .... | .... | .... | 3 | .... | .... | .... | .... | .... | .... | 7 |
| Three | .... | .... | .... | 3 | .... | 1 | .... | 1 | .... | 2 | .... | .... | .... | 7 |
| Four | .... | .... | .... | .... | 1 | 1 | .... | .... | .... | .... | .... | .... | .... | 2 |
| Two pair | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 |
| Horizontal and short vertical | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 |
| Decorated bottom sherds | | | | | | | | | | | | | | |
| Lines | 3 | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 4 |
| Grass matting | 1 | .... | .... | 1 | 1 | .... | .... | 2 | .... | .... | 1 | .... | .... | 6 |
| Zigzag line | .... | 1 | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | 2 |
| With striations | .... | 1 | .... | .... | .... | .... | 1 | .... | 1 | .... | .... | .... | .... | 3 |
| Lines and dots | 2 | 1 | 1 | .... | .... | .... | 1 | .... | .... | 1 | .... | .... | .... | 6 |
| With inside ridges | 1 | 1 | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | 3 |
| With split dots | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | 1 |
| Miscellaneous | | | | | | | | | | | | | | |
| Dots outside, inside ridges, rim knob | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 |
| Dots outside, inside ridges | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 |
| Dots outside, four lines inside | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 |
| Pair of lines with a double V | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 |
| Constricted bands | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 |
| Lip across the sherd | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | 1 |

9; Fig. 11). Grass matting imprints on the bottom of vessels is also reported from the Togiak and Kuskokwim River regions (de Laguna, 1947, p. 228).

The most unusual pottery decoration at Hooper Bay Village is the zigzag line. This design has not been reported previously from Alaska, although, as will be discussed later, its presence here is not unexpected.

Line and dot designed sherds are not plentiful at the Hooper Bay site; this is surprising, since the majority of decorated cooking pots that de Laguna (1947, pp. 142-9) has from the adjacent Yukon River are decorated in this manner. Methods of line and dot presentation common to both the Yukon sites and Hooper Bay are: a single line and a row of dots below; groups of two dots; split dots; and triangular groups of dots. The dot patterns are all on lined sherds. Found on the Yukon but not at Hooper Bay are: a row of dots above a line; pairs of vertically or diagonally parallel lines with dots between the lines; and more than four lines in a series. At Hooper Bay but not on the Yukon is a vertical series of dots beneath a line. The one line and dot decorated sherd from St. Michael (see appendix) is similar to some of the Yukon sherds in having two parallel lines and a row of dots below. To the south of Hooper Bay, cooking pots from Togiak and Kuskokwim rivers are decorated with lines and rows or groups of dots below. These designs (de Laguna, 1947, p. 228) "show a greater range of motifs" than do the Yukon pots. A line-dot decorated ware was also reported by Larsen (1950, p. 180) from Platinum South Spit.

The ridges, knobs, and grooved rims referred to in the various descriptions of Hooper Bay pots are rare, but to be found, in other Alaskan pottery-bearing sites. The ridges on Hooper Bay pots are always on the inside of the vessel and near the rim. Some of the Hooper Bay sherds have grooves that are only wide lines, with or without rounded ridges. One of the pots that Nelson (1899, p. 202) describes as being used at St. Michael had grooves and ridges both inside and out. Archaeological sherds from St. Michael (see appendix) have wide, smooth ridges and grooves, but they are on the inside of the vessel. Many of the Yukon pots (de Laguna, 1947, pp. 142-9) have inside ridges and grooves similar to both St. Michael and Hooper Bay vessels. Outside ridges are also reported by Heizer (1949, pp. 48-55) from Kodiak Island. The only cooking pot reported with a lip knob, other than the one from Hooper Bay, was found on the Yukon River at Fox Creek (de Laguna, 1947, p. 145, Pl. 24, 2). It has a small lip knob, and the sherd is decorated with lines and dots. Also from the Yukon is a lamp with a knobbed rim, but it is the only one of its type reported. Lip sherds with a line on the top of the rim (grooved rims) are found both at Hooper Bay and on the Yukon River. At both places the pot itself may or may not be decorated. This same feature is reported by de Laguna (1947, p. 228) from the Togiak and Kuskokwim rivers, but Larsen (1950, p. 180) points out that he did not find grooved rims at the recent site of Platinum South Spit.

Conforming with the majority of Eskimo pottery, the Hooper Bay vessels appear to have been made by the patch modeling method. Judging from the number of complete pot bottoms recovered, it is likely that the flat-bottoms were made from a single piece of clay; the sides were built up by adding pieces of clay that were nearly rectangular. These findings concur with the description by Alec Smart of historic pottery making at Hooper Bay Village. Although most of the pots reported from Alaska were made by the patching method, the coiling process has also been noted. Nelson (1899, p. 201) in his description of pottery making at St. Michael, mentions that "a wall is built up with a thin band of clay, carried around a number of times until the desired height is reached." This same type of manufacture is reported from Point Hope (Mathiassen, 1930, p. 66; de Laguna, 1947, p. 230) although it is possible that the surface of this pot has been stick paddled and is not actually coiled. Collins (1937, p. 168) has one coiled sherd from an Old Bering Sea site on St. Lawrence Island.

Crushed rock and small pebbles, or a combination of the two, were the dominant types of tempering material at Hooper Bay; the presence of a few grass-tempered sherds indicates that grass too was known as a tempering agent. The use of organic temper, such as sand, gravel, or crushed rock, is distributed from the southern to the northern limits of Eskimo pottery (de Laguna, 1934, p. 68; Weyer, 1930, p. 263; Collins, 1928, p. 254, Figs. 1-4 after de Laguna, 1947, pp. 227-9; Collins, 1937, p. 167;

Mathiassen, 1927, vol. I, pp. 66). It is quite common to find the two types of temper, organic and inorganic, used in the same vessel; such a combination is reported from all along coastal Alaska (Larsen, 1950, pp. 180-1; de Laguna, 1947, p. 227; Nelson, 1899, p. 201; also see appendix). However, organic temper, feathers, used alone has been found in some Yukon sherds (de Laguna, 1947, p. 227), and grass alone has been used in some of the pots from the Old Bering Sea culture (Collins, 1937, p. 167).

De Laguna (1947) in her analysis of Eskimo pottery stresses the connection between Bristol Bay-Norton Sound and certain Kurilian-Kamchatkan wares, showing that there are far too many distinctive pottery characteristics present in both regions to be attributable to chance. The pottery features present in both the Kuriles and southern Alaska are: situla-shaped vessels, rim knobs, organic temper, the coiling technique, and line-dot decorations. Those features of Kamchatkan pottery that have parallels in southern Alaska are: inside and outside grooves and ridges, suspension holes, rim knobs, grooved rims, and various forms of line-dot decorations. The zigzag line found at Hooper Bay may now be added to the list of pottery designs from both areas since half of the illustrated sherds found by Jochelson (1928, Pl. 19, A) at the Kulki River site in northwestern Kamchatka are decorated in the same manner. Distribution in Siberia of the above types of pottery, with the exception of a ridged and grooved sherd from a Koryak site (Jochelson, 1905, vol. 2, p. 186), is confined to the Kuriles and Kamchatka. None have been reported in the vicinity of Bering Strait either in Siberia or Alaska; in Alaska this type ware is primarily confined to the Bristol Bay-Norton Sound region.

According to Schnell (1932, pp. 62ff, from de Laguna, 1947, p. 237) Kamchatkan sites in which line-dot and zigzag decorated sherds appear date from the eleventh to the middle of the eighteenth centuries. This dating is consistent with the time at which this ware appears in southern Alaska and would agree with the known pottery sequence in the latter region. Considering the acknowledged exchange of cultural elements between the Aleutian Islands and Kamchatka (de Laguna, 1934, pp. 216-8; Collins, 1937, pp. 376-8; Heizer, 1943, pp. 419-53), it would not be surprising to find that the situla shaped pot, line-dot decorations etc., were introduced into Alaska by way of the Aleutian Island. However, assuming that this form of ware did arrive in Alaska via the Aleutians, it is difficult to understand the virtual absence of pottery in archaeological sites from the latter region unless the traits moved quite rapidly and established themselves in the Bristol Bay area where the people were already pottery users rather than in the Aleutians where there was no pottery tradition.

## SUMMARY

The vessel shapes and other characteristic features of the Hooper Bay pottery make it apparent that this ware fits into the Bristol Bay-Norton Sound pottery category as defined by de Laguna (1947, pp. 228-9). The zigzag and striated designs may now be added to the previously mentioned list of elements present in the region; the former may be considered as a recent innovation that arrived with the situla shape, line-dot decorations and other distinctive associated features, whereas the striated ware (and the flat-bottomed pot with nearly straight sides) may be considered as the survival of an old Eskimo pottery style.

## APPENDIX

This section is devoted to the previously unpublished description of potsherds in the University of Alaska collections. These sherds are primarily from northern and western Alaska.

From the Firth River, Canada (University of Alaska M-5255 to 5312), is a single rim sherd with a rounded and slightly outward flaring lip. The sherd is 11 mm. thick, tempered with crushed rock and an abundance of grass. It is discolored on one surface from weathering, but the original color, on the opposite face, appears to have been buff. The sherd was found in association with prehistoric but comparatively recent artifacts, including ground slate, armor plate, a whalebone sled shoe, etc.

The material from a recent house on the Kiwalik River excavated by the Bering Strait Expedition in 1950 contains 16 sherds (University of Alaska, 1950-2035 to 2050). Of these, 3 were rim sherds with rounded lips, thick walls (16 mm.) and a smooth exterior surface. The other sherds are also thick, ranging from 8 to 20 mm. with an average thickness of 12 mm. The majority of the sherds have a reddish outer and inner

FIG. 11. Hooper Bay Village vessel bottom with grass matting impression.

surface, with a black center; a few sherds are either all black or red. All the sherds are tempered with feathers and varying amounts of finely crushed rock.

A house abandoned in 1902 at Deering, Alaska and excavated by the Bering Strait Expedition contained 12 potsherds (University of Alaska, 1950-1988 to 1999), all with a checkstamped outer surface. There are two rim sherds in the collection; one has a flat lip and the other, a rounded lip. The latter is tempered with feathers, crushed rock, and small pebbles. A preliminary examination of the other sherds indicates that they are tempered with crushed rock. The average thickness of the ware is 11 mm., with the sherds ranging from 8 to 18 mm. The color of the outer surfaces is consistently black. All of the sherds tend to exfoliate; one sherd has a suspension hole.

Two King Island potsherds (University of Alaska, M-3743 to 3744), probably quite recent, are from vessels of different forms. One has a suspension lug on the outer surface near the flat rim and is from a rectangular pot. This sherd is tempered with sand, is 10 mm. thick, gray colored and has a hard surface finish. The second sherd is 19 cm. long; from the base it flares slightly to more than half way up the side and then constricts slightly, flaring again at the rim. The lip is rounded and slopes inward. The outer surface is decorated with a series of short, horizontal, parallel lines; one series of these lines extends up the side of the sherd to within a third of the distance of the rim. It is tempered with both feathers and crushed rock and is somewhat weathered, but the original color can be determined as ranging from gray to black. This pot fragment is 10 mm. thick and has a firm surface.

Thirteen sherds from a recent site at St. Michael (University of Alaska, M-4878-4891) are tempered with grass and small pebbles. One sherd is a complete bottom from a flat-bottomed vessel. It is 11.5 cm. in diameter and about 10 mm. thick; another bottom sherd is 5 mm. thick. The 8 rim sherds are of the following types: flat (2), rounded (2), ∧ shaped (2), and ∧ shaped with an outer bulge at the rim (2). On the inside of 3 of the rim sherds are small ridges and grooves similar to those from Hooper Bay. Three sherds are decorated with 3, 4, and 5 horizontal, parallel lines respectively; another decorated sherd has two horizontal lines with angular dots attached to the lower side of the bottom line. This sherd also has a suspension hole. Nine of the sherds are black; 3 are reddish on the exterior surface and black inside. One sherd is buff on the outside and black inside. The average thickness for the sherds other than basal is 9 mm., with the thickest being 12 mm. and the thinnest 6 mm.

A small flat-bottomed pot with slightly flaring sides was presented to the University of Alaska Museum by Mr. and Mrs. C. Myers of Kwethluk, Alaska (University of Alaska, Acc. 522). This pot, found at an abandoned village on Nelson Island, is in all probability quite recent. The vessel has a basal diameter of 9 cm., stands 12.5 cm. high, and has a diameter at the mouth of 12.5 cm. The average thickness of the pot is 6 mm.; it is gray-black in color, and tempered with a few pebbles and crushed rock or sand (Fig. 12).

FIG. 12. Pottery vessel from Nelson Island, this pot stands 12.5 cm. high and has a diameter at the mouth of 12.5 cm.

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# LATE ESKIMO ARCHAEOLOGY IN THE WESTERN MACKENZIE DELTA AREA

DOUGLAS OSBORNE

ALTHOUGH the American Philosophical Society—University of New Mexico Mackenzie Valley Expedition of 1938 (Bliss, 1939, p. 365) was not primarily concerned with Eskimo archaeology, the members felt, while at the trading rendezvous Aklavik on the lower Mackenzie River, that the opportunity to run down to the Arctic coast was too obvious to be neglected. The archaeology of the Western Eskimo of the Mackenzie area has never been well studied; little, as a matter of fact, has been added since 1930 when Mathiassen wrote the introduction to his Western Eskimo report. This paper will add somewhat to a meager store of fact.

During the nine-day trip, we examined ten Eskimo graves and five house sites as well as several miles of eroded and washed shore areas between Shingle Point and Blow River, Yukon Territory (Figure 13; see also Report, Canadian Arctic Expedition, Vol. 9, map). Here, the physiographic contrast is sharp between the Mackenzie delta and the high gravel and clay shores. These, eroded from the highlands inland, rise 100 to 150 feet above the sea. Local rivers are deeply incised in the unconsolidated material. The mouth of Blow River lies about 3 miles southeast from Shingle Point, along Shoalwater Bay. Here the water is saline, while only a short way on, toward the delta, the water is fresh because of the enormous volume of the Mackenzie.

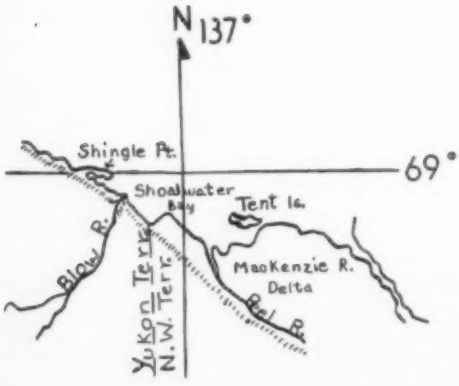


FIG. 13.

Blow River has incised itself deeply into the high shoreline, almost to base level, for at least a mile back from the sea and has carved out a section of the coast for several hundred yards on either side of its mouth and built a small delta. The flood plain runs inland up its wide canyon for about one mile. Here, clustered on the low delta around the mouth or mouths of the Blow, were a number of Eskimo houses. Most of these, built in the old vertical-log style instead of the more recent horizontal log-cabin method, were in ruins. There were, however, two or three later houses, and one or two of these seemed to have been occupied during the preceding winter. Driftwood from the Mackenzie, probably ultimately from the Liard system, provides building timber and fuel for these Eskimo.

On the high shore or headlands flanking Blow River on the northwest were most of the older graves. Here, too, was the recent graveyard, with its several interments more or less neatly mounded and with white paling fences in general disrepair. At this site we investigated eight graves and three houses. Figure 14 is a generalized sketch of the Blow River mouth and its environs.

## BURIALS—SHINGLE POINT

At Shingle Point (Stefánsson, 1914a, p. 23) we examined two graves. Most graves on the high seashore were marked by a pile of logs (Fig. 15). Typically, thirty or forty small, 4-to-8-inch logs or poles 10 to 15 feet long were piled over and lengthwise of the corpse. The dead had been simply laid on the frozen tundra and the driftwood piled over. Occasionally a slight depression appeared, as if a summer burial had been made and the thawed muskeg had been scraped away to a depth of 6 inches or less. Often the body was protected by a boxing of large-diameter head, foot, and side logs. Frost, the logs, and the proximity of the large Shingle Point village seem to have protected the burials from the depredations of carnivores. The skeletons (not studied) and artifacts found are now in the University of New Mexico collections.

Shingle Point 1, on a headland above the point, was a large male in middle age. The head was southeast, the body loosely semi-flexed on the back. A pipestem (Fig. 16, 5), loon bill (Fig. 16, 7), and clasp knife were found among the ribs.

Shingle Point 2 was the best of several infant or child burials found on the Shingle Point Spit. These seem not to have been treated as carefully as the older individuals in the log graves on the headlands. On the other hand, they were more deeply interred. The child (Shingle Point 2) lay semi-flexed, on its back, head north-north-west, face to the right (Fig. 18). An old packing box, with lid in place, was the coffin.

A few other burials, disintegrated or disturbed, were noted near the village on the bar or spit. No information could be gained from them.

### BURIALS—BLOW RIVER

Blow River 1 had a number of artifacts (Fig. 19), mostly near the head and shoulders. There was no skull, unfortunately a normal situation, but the disturbed grave yielded the remainder of a skeleton. Some of the missing skulls may have been among the number collected by Stefánsson and now in the American Museum of Natural History; or they may have been taken by a surveying party which preceded us. The body had been placed in the grave extended, head southeast. Several bark amulet (?) boxes were near the feet. A broken pole, with one shaped end, possibly a sail-pole or mast, lay nearby. Another part of the mast lay near grave 6. These pieces may have belonged to the umiak found near grave 3. Lying beside, to the south of the grave, was a broken short sled of the Mackenzie delta type (Fig. 20). The runners, cut from a plank, were 70 inches long. The height from the ground to the upturned point was 21 inches; the height or width of the runners, in the middle, 8¼ inches; the thickness in the middle, 1⅛ inches. There were three cross-braces; one whole brace, probably a larger center one, was 33½ inches long. The sled was 31-38 inches wide. Eight holes, which showed no placement pattern, were still visible in the badly-rotted runners. Figure 17, 4 and 6, illustrate broken sections of the sled

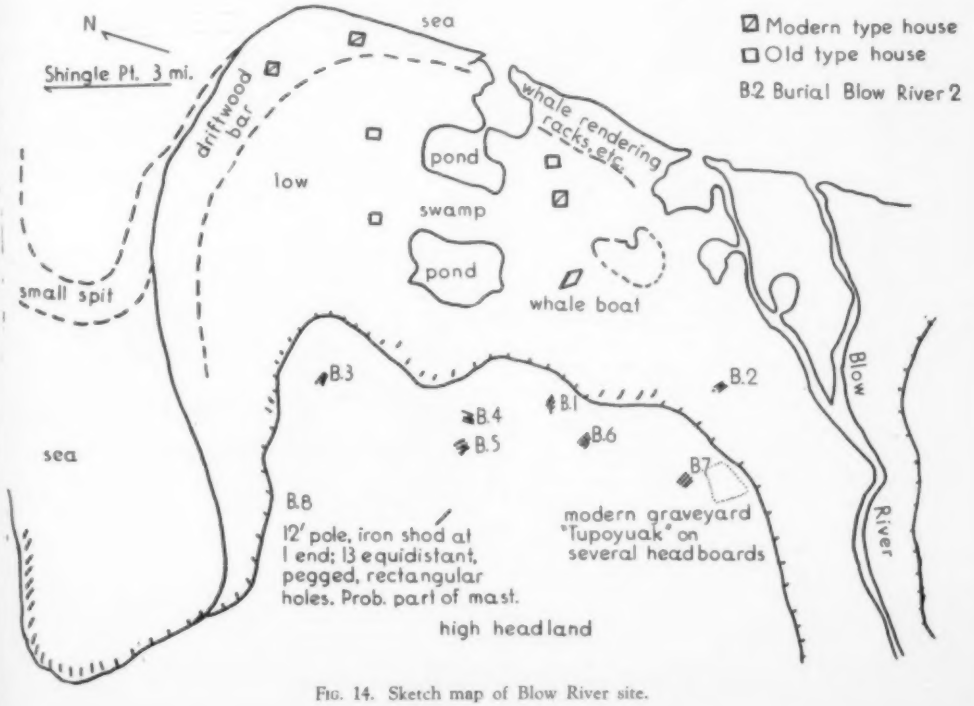


FIG. 14. Sketch map of Blow River site.

FIG. 15. Typical log-pile covered Shingle Point burial.

shoes: sawed strips of heavy, coarse-grained bone, probably whale mandible. The average thickness is about one-half inch. The shoes had been pegged to the runners with small wooden pegs, some pieces of which still remained in the holes. An iron knife blade in a hide sheath lay near the central part of the grave. About 8 inches long, blade and handle tongue, it seems to have been an early type of trade knife (not illustrated).

Blow River 2 (Fig. 21) occupied the only log grave not on the high shore above the Blow River delta. Parts of the skull and other bones showed through cracks between the logs and were bleached by exposure. Many of the smaller bones were disintegrated; the skull and large bones, however, were well preserved. The head was to the northwest; the body on the back, extended. It had been wrapped in a medium-weight sailcloth or canvas.

Blow River 3 (Fig. 15) yielded little skeletal material; a child's skull cap was found with the adult bones. Orientation was southeast; the deposition, probably extended on the back. The artifacts lay in a compact group in the area of the upper body and to its right (Fig. 22), where they were mingled with the disturbed vertebrae, ribs, and right arm bones. This burial probably illustrates the sacrifice of a boat; fragments of an umiak which showed several non-umiak or canoe-like attributes lay nearby. It was made of light, strong wood, probably spruce drift. The over-all length was between 25 and 28 feet; the beam, something over 56 inches. The keel, 19 feet 2 inches, in length, was roughly triangular in cross section, 3¾ inches on a side. A curving triangular bow piece, 40 inches long and 3 inches on a side, was lashed to the keel with baleen (Fig. 23, *B*). A stern piece of similar nature and size but of different shape may be inferred. The flat bow and stern deckpieces of the regular

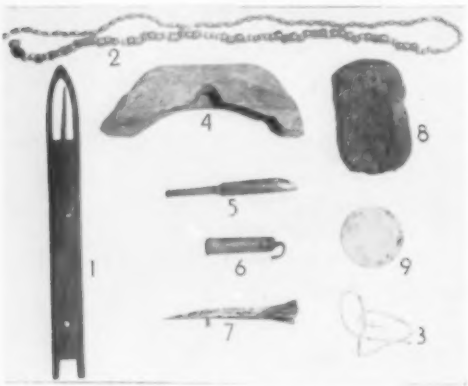


FIG. 16. *1*, netting shuttle, non-Eskimo type, 10¼" long, found near a ruined Blow River house of late type. It is of a hard, walnut-like wood, foreign to the north. *2*, blue glass beads from grave Blow River 2, oval beads are turquoise and translucent. *3*, yellow and white seed beads, same grave. *4*, snow goggles of soft wood. *5*, Shingle Point 1, fragment of wood pipestem, brass mouthpiece, typical (see Nelson, 1899, Pl. 88). *6*, case of 45-70 brass cartridge, wood plug with leather tab, containing rusted needles. Cartridge shell dates from before 1900 (George Schafer, Needles, Arizona, personal communication). *7*, Shingle Point 1, upper part of loon bill; probably part of a loon-skin dancing fillet (Nelson, 1899, p. 417). *8*, bark container, from floor debris of BR-house 3. *9*, burning glass.

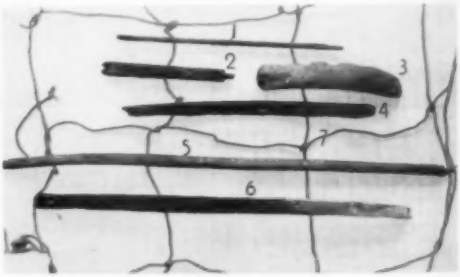


FIG. 17. (Photographed on 1-inch coordinate paper). *1*, fragment, willow arrowshaft, Blow River 6. *2*, end of large self-bow, probable length *ca.* 5 feet (grave 3). *5*, child's bow (near a Blow River house) same type as *2*, both spruce. *3*, pick-axe, wedge or mattock of fossil ivory. *4*, *6*, bone sled shoes, fragmentary. *7*, fragment of "whitefish" (Beluga) or seal net.

umiak were not present. The ribs were lashed along the keel about every 12 inches; three were still in place about 6 feet from the bow. They were fitted to the triangular keel and lashed with baleen (Fig. 23,*B*). These ribs were 1½ inches broad at the ends, 1 inch thick, and almost 2 feet long. There were strakes, probably only a single narrow one on each side, but the fragmentary condition of the pieces made impossible a coherent picture of their position in the body of the vessel. Only one thwart (Fig. 23, *C*) was identified; it is rather peculiar in shape. Another peculiarity in the structure was the presence of the double gunwale. The ribs were caught between these gunwales and tightly lashed there (Fig. 23, *D*). The gunwales themselves were lashed together for further stability about every 43 inches. All lashings were of baleen. A pointed spruce paddle (Fig. 29) found near the center of the grave area, may have been associated with the boat.

Blow River 4 was in poor condition. It had been disturbed and the rotted condition of the logs over the body bespoke great age. The head was to the south. Near the head was a single-barbed bone arrowpoint, and near the left arm were three blue glass trade beads of the type that, I believe, de Laguna (1947, p. 138) calls Cook beads.

Blow River 5 (Fig. 24) lay, following the usual custom, with the head to the southeast. The skull was missing, but the mandible was present. One pelvic bone lay near the mandible, which was more or less in place. While obviously disturbed, the bones still lay in rough anatomical relation.

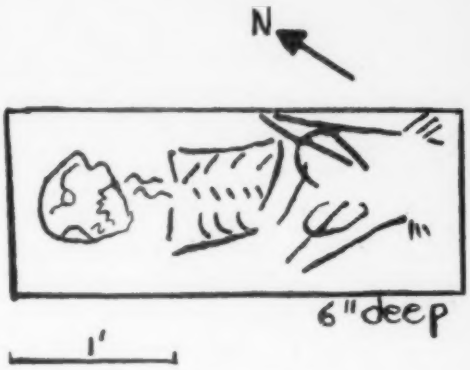


FIG. 18. Shingle Point burial 2.

Blow River 6, extended, head south-southeast, was unusual in that it was lying prone. The other burials were all on the back. Again there was no skull, but the mandible was present. On the right shoulder and parallel with the body was a bundle of at least 6 bone-pointed arrowshafts. The points lay beneath and over the shoulder; two had iron heads inserted in the bone. There were a few "bam" (Balm of Gilead, *Populus balsamifera*) bark boxes and a large bark effigy (?) (Fig. 30, *15*) at the left shoulder. Two marble labrets lay over the left side of the sacrum. A decayed

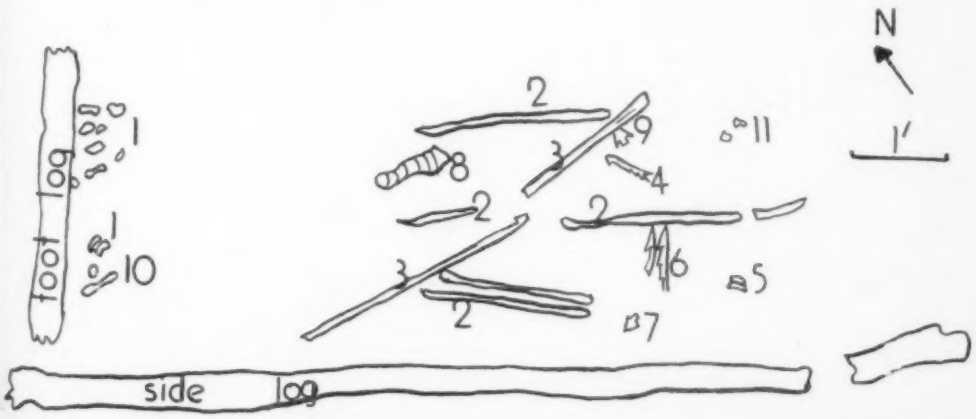


FIG. 19. Blow River grave 1 artifacts. *1*, bark boxes; *2*, broken arrowshaft; *3*, broken self-bow; *4*, arrowhead and barbed foreshaft; *5*, ulu handle; *6*, bone arrowheads; *7*, arrowhead; *8*, knife in hide sheath; *9*, copper arrowhead; *10*, bone awl; *11*, labrets (beside head).

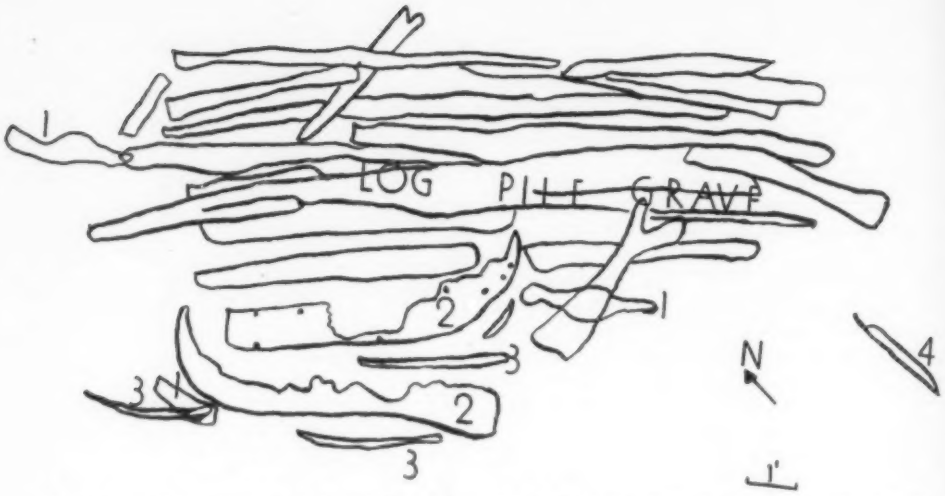


FIG. 20. Blow River grave 1. *1*, sled cross braces; *2*, runners; *3*, bone sled shoes; *4*, base of sail pole or mast.

and disturbed caribou hide bag or shroud covered most of the lower body and was bunched at the left side; no pattern was discernible. It had been made of strips sewed together with one-half inch running stitches using 3-strand braided sinew. This burial is not figured.

Blow River 7 (Fig. 25) was the most recent grave opened. It lay near, but not in, the previously mentioned modern graveyard. Its orientation was typically southeast, the deposition extended, supine, face to left. It appeared that the usual orientation was preserved in the modern graveyard. The grave goods found were modern: a 44-40 caliber Winchester of 1896 model, a No. 4 trap, a tablespoon, a four-gallon granite-ware pot, a claw hammer, and a two-inch burning glass (Fig. 16, 9). This large male had been covered with skins, as had No. 6. He had been roughly but securely boxed in with head, foot, and side logs before the logs and poles were piled over the grave.

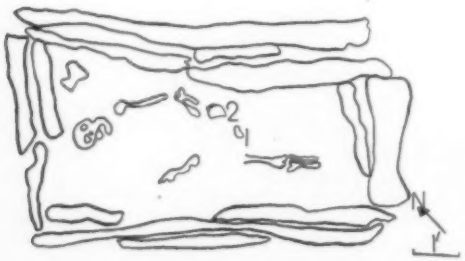


FIG. 21. Blow River burial 2. *1*, ulu handle; *2*, string of seed and blue trade beads. Also found: 45-70 cartridge needle case.

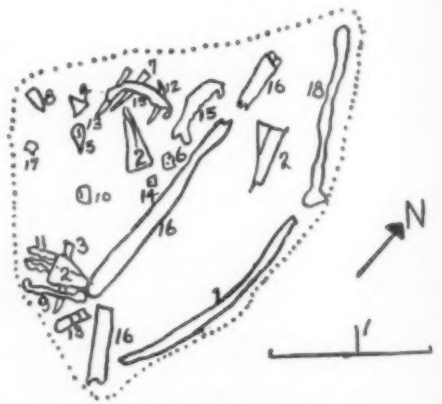


FIG. 22. Artifacts of Blow River burial 3. *1*, large bone dagger; *2*, cut down caribou (?) scapulae; *3*, crooked knife (?) handle; *4*, bird "bunt"; *5*, large flint point; *6*, chalcedony end scraper; *7*, bone awl; *8*, slate projectile point; *9*, bone bag handle; *10*, piece of nephrite; *11*, four barbed bone arrowheads; *12*, double-pointed bone awl; *13*, worked antler; *14*, perforated piece of bone; *15*, half of dog mandible; *16*, broken self-bow; *17*, broken chalcedony point; *18*, humerus (right) of Blow River burial 3.

FIG. 23. a, Blow River grave 3 and umiak. *1*, keel; *2*, ribs; *3*, pieces of gunwale; *4*, pieces of strakes; *5*, bow piece; *6*, thwart (seat?). *c*, thwart and/or seat of grave 3 umiak; *d*, gunwale and ribs of grave 3 umiak.

Grave 8 was perhaps the oldest found. It was marked by a few log fragments, badly rotted; the bones had been removed or had disintegrated. The large slate knife (Fig. 31, 1) was all that was found in it.

## STRUCTURES—SHINGLE POINT

Most of the houses at the modern Eskimo village at Shingle Point are typically extended log cabins or frame houses. On the spit are a few tipi-shaped affairs of poles leaned together. These are summer fishing camps; drying and rendering racks were nearby (Fig. 26).

Toward Blow River from Shingle Point, on the high shore, was a ruined log lean-to shelter. In its construction a supporting triangle of forked poles was first set up. Upon this a number of long pole stringers rested. Shorter poles and logs against this ridge closed the sides and ends. Floor poles were present.

Other structures common at Shingle Point were the numerous cache pits, usually on a high or well-drained area. We cleared one of these completely; it was 4 feet 3 inches square and something over a foot deep. Three

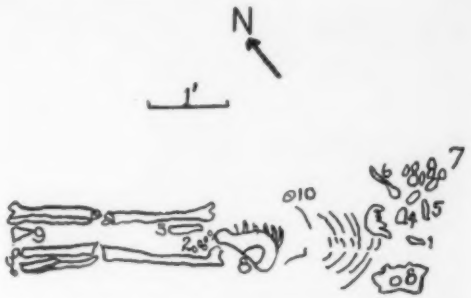


FIG. 24. Blow River grave 5. *1*, nephrite sinker; *2*, beads; *3*, iron tube (pipestem); *4*, ulu handle; *5*, hollow bone tube; *6*, bone arrowhead; *7*, bark boxes; *8*, pelvic bones; *9*, sacrum; *10*, iron bracelet.

sides were built up log-cabin-fashion, while the fourth was made of lumber scrap. The grease-soaked pit was floored with lumber scrap and hewed pieces.

## STRUCTURES—BLOW RIVER

At Blow River, as has been mentioned, the situation varied considerably from that at Shingle Point. Here, a few of the houses were obviously built along rather recent lines; they combined a typical log cabin with a low-pitched gable roof and an antechamber of vertical logs, roofed in the same manner as the cabin. The majority was older, ruined, and built in a far different manner (Fig. 27). For these latter, vertically placed driftwood logs formed the walls of the single room and an antechamber, the latter the same as that of

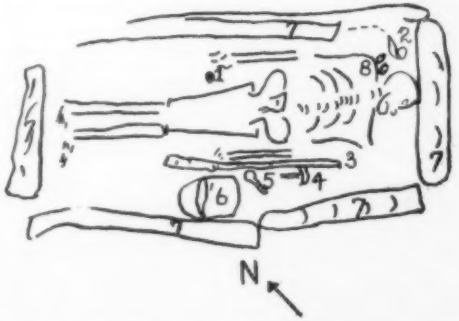


FIG. 25. Blow River grave 7. *1*, burning glass; *2*, No. 4 spring trap; *3*, 44-40 Winchester; *4*, claw hammer; *5*, tablespoon; *6*, 4 gallon graniteware pot; *7*, logs outlining grave; *8*, marble labrets.

Fig. 26. Camps and drying racks, Shingle Point.

the more recent cabins. The flat, earth-covered roofs were supported, generally, by four central posts. Evidently these houses were well sodded or banked with earth and chinked with moss. The interiors seemed to be slightly sunken; all faced upon the sea. The larger room was generally 10 by 12 feet; the antechamber, usually about one-half the size of the main room, was always at one end of the long axis of this main room. It was roofed and probably served as a storeroom, dog house, etc. The dimensions and general plan of a typical old house are illustrated in Figure 28. All of these roofs are low; the older houses must have been ceiled at 6 to 7½ feet from the floor. Excavation and probing of the Blow River houses revealed the usual low sleeping benches. One house (3) was rather thoroughly investigated. In it were found, besides a miscellaneous assortment of small animal bones, a hollow cylindrical bone tube (Fig. 32, 9) and a bark box (?) (Fig. 16, 8).

Fig. 27. Old-type House, Blow River,

Pertinent information on artifacts from graves and house sites is given in the captions of Figures 16, 17, 24, 25, 31, and 32.

## Comparisons and Summary

A glance at the descriptions given reveals that, in the large, the Kigirktarugmiut (Stefánsson, 1914a, map opposite p. 10), Shingle Point-Blow River burials and structures are typical of the Eskimo as a whole and of the sub-area under discussion in particular. This conclusion is reinforced by the following comparative notes.

Stefánsson has stated that short sleds and kayaks were often broken on the grave by the Mackenzie (1914a, p. 193) and by the Point Barrow Eskimo (1914a, p. 190). The Blow River grave sled was presumably sacrificed after taking the dead man from the village. It was of the type shown by Boas (1888, p. 529) for the Central Eskimo, and only in the up-curving height of the runners does it differ from the usual flat sledge or simple sled

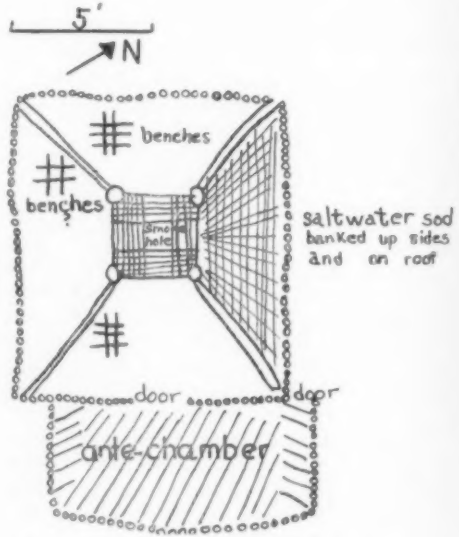


Fig. 28. Ground Plan, Blow River Old-type House.

Fig. 29.

mentioned by Murdock (1892, p. 355) for Point Barrow. Apparently either three or four cross-braces are usual for the western sled. Stefánsson describes (1914a, pp. 78-80) a three-brace type but elsewhere (p. 306) states that four crossbars were more common. The shoes and the pegging of them to the runners are typical (Nelson, 1899, pp. 205-8). Mathiassen (1927, Pt. 1, p. 43 ff.) discusses similar but wider forms.

The umiak found at grave 3 has been as well described as possible. Its baleen lashing should have made it far safer than the raw-hide-lashed boats which Nelson (1899, p. 218) described as prone to fall apart in heavy weather and after prolonged wetting. A certain extreme lightness of construction, plus the presence of the double gunwale, keel to gunwale ribs, strakes, etc., calls to mind the pattern of the Indian spruce and birch bark canoes which were contemporaneously in use up the Mackenzie. Certainly, the double gunwale is not generally embodied in umiak construction (but see Boas, 1888, Fig. 478). It would seem that Indian influence had made itself felt in this way at Shingle Point.

The older type of house is built roughly on the same pattern of that illustrated by Murdock (1892, p. 77). The differences are that the probably more recent Blow River house was not as thoroughly earth-covered, lacked the underground passageway entrance,

FIG. 30. Boxes and effigies of the cork-like Balm of Gilead bark. *15* is 8½ inches, *3* is 1.7 inches long. *1* to *5* were at the feet of Blow River 1, *6* to *14* at right of vacant head region of BR-5. *15*, not a container (probably an effigy) lay near the left shoulder of burial 6. *3* lacks a cover; it and the pair *11* and *12* could not have been efficient containers although a small cavity is seen in each. All but *5*, *9*, *10*, *11* and *12* are rather certainly effigies: quadruped, fish, or seal.

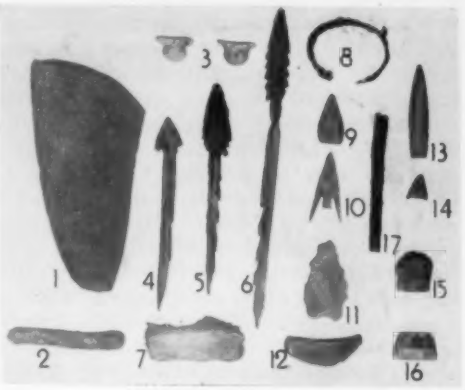


FIG. 31. *1*, 6¼ inches long, Blow River grave 8, is an old-type handleless slate knife. The slate for both *1* and *9* probably came from deposits up the Mackenzie (Richardson, 1852, p. 131). *2* (BR-5), *7* (BR-1), *12* (BR-5), *16* (BR-2) are bone handles of ulus. The iron blades have rusted away. *16* is the modern form of ulu handles seen in use locally. *3* labrets of marble (grave 7). Pairs of labrets were also found in BR graves 6 and 1. They lay to the left of the sacrum in BR-6 and at the right of the head in BR-1 and -7. *4* (BR-1), *5*, *6* (beneath right shoulder BR-6) composite arrowheads. *8*, iron bracelet (BR-5). *9*, small slate point (BR-3). *14* (BR-3), chalcedony, broken, had diagonal notches and small barbs, the stem is lacking. *11* (BR-3), brown flint, is a nondescript large point or small knife. *15* (BR-3), gray-black banded chalcedony endscraper. *10* (BR-1), copper point of type used with barbed bone foreshafts. *17* (BR-5), iron tube with wood interior, probably pipestem. *13* (BR-5), nephrite; Mathiassen (1930, p. 42; Pl. 4, No. 5), identifies it as a fishing-line sinker but there is no ethnographic reference.

and was built of much more rough-and-ready material. About the same can be said of the house at Kukulik on St. Lawrence Island (Geist and Rainey, 1936, p. 62, Fig. 2). We saw none of the cross-shaped Mackenzie houses (Collins, 1937, p. 268 ff.).

Wrapping the dead in skins is, seemingly, typical of the area, as is an east or southeast orientation (Murdock, 1892, pp. 424 and 426). Shrouding of the uncoffined body is an Eskimo and northern Athapascan trait and has, indeed, an extensive distribution far to the south.

The bow (Fig. 17, 5) is apparently a typical self-bow. Geist and Rainey (1936, Pl. 47) illustrate a similar one, with the same string nocks, from St. Lawrence Island. The pick or mattock (Fig. 17, 3) is again a widespread arctic implement. Murdock (1892, p. 303) shows similar objects.

It is difficult to suggest a use for the "bam" bark boxes (Fig. 30) other than that they were amulets or effigies or amulet containers. They are neither made of strong enough material nor are most of them large enough to serve as tool or trinket boxes. There is no evidence that they were paint boxes. Conceivably, a few of them could have been snuff or tobacco containers or quid boxes, but in that case one individual would probably not have been buried with several. The fact that one, the largest, is an effigy only would seem to indicate a non-utilitarian function for this class of objects. Mathiassen (1930, p. 18) mentions amulet boxes, as does Murdock (1892, p. 434 ff.), but they are rectangular; de Laguna (1947, p. 279, *7*) discusses animal or human images in the grave. Both Frederica de Laguna, of Bryn Mawr College, and Henry B. Collins, of the Smithsonian Institution, have fortified in correspondence the conclusion that the objects are amulet boxes.

The netting needle (Fig. 16, *1*) is of interest because of the type. This would appear to have a southern derivation. Nelson (1899, p. 192) arrived at the same conclusion; he illustrates two shuttles of this type. The usual type of Eskimo needle, that illustrated by Murdock (1892, p. 512 *seq.*) for the Point Barrow Eskimo, is entirely different. Figure 16, *1* on the other hand, is a typical Indian (and ubiquitous) needle.

The slate blade (Fig. 31, *1*) is unique in the collection, both in consideration of its type and age. Geist and Rainey (1936, p. 124, Pl. 33, *1-4*, Pl. 49, *1, 2*) and de Laguna (1947, p. 276, 6) reinforce this conclusion. The grave from which it was taken was certainly prehistoric (speaking with the mind's eye on the lag northward, French-English, and eastward, Alaskan-Russian acculturation). Such a statement would imply that the period of grave 8 was not later than the early 19th or late 18th centuries.

The simple labrets (Fig. 31, 3) were fashioned of fine white marble (see Murdock, 1892, Pl. 16, 17) and are similar to several illustrated by Nelson (1899, Pl. 22). Stefánsson (1914a, p. 152) mentions that labrets (like rifles) were sometimes but not often buried with the owner, possibly because of their value. When buried, the labrets were placed at the right of the head, they were not left in place (Stefánsson, 1914a, p. 193). Probably, as the custom of labret-wearing fell into disuse, there was less desire on the part of the survivors to withhold these ornaments from the grave. It is interesting to note that one of the three labret-bearing graves was certainly of the latest of the series.

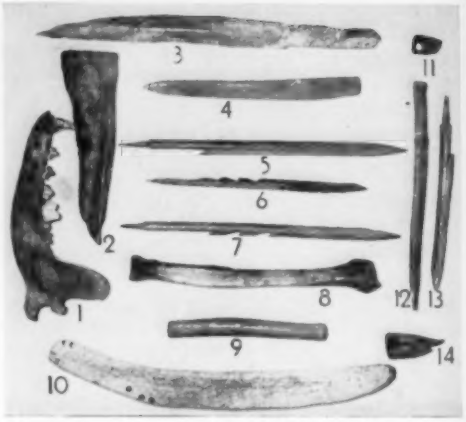


FIG. 32. Bone objects *1* (BR-3), unaltered halved mandible of wolf or dog. *2*, 6⅞ inches long, is a caribou scapula scraper. *4* (BR-3), was probably the handle of the aboriginal form of the crooked knife. *1, 5, 6,* and *13*, are simple bone hunting or war arrowpoints. *8*, (BR-3), dog or wolf radius; probably a bucket handle (Thalbitzer, 1914, Fig. 191). *9*, bone snuff or drinking tube. *10*, snow knife (Nelson, 1899, Pl. 94, Boas, 1888, p. 539, Fig. 490) or skin scraper (Nelson, 1899, Pl. 50).

Composite arrowpoints are an Eskimo-wide trait, at the least. Kane (1856, v. 2, p. 223) illustrates a typical implement from the Polar Eskimo, Murdock (1892, p. 203) describes the type at Point Barrow, and Nelson (1899, p. 157 *seq.*, Pl. 61) from Western Alaska. Iron bracelets of the open type (Fig. 31, 8) had great favor in America in early trade days. Nelson (1899, p. 58) and Murdock (1892, p. 148) both list them for Alaska. Slate points (Fig. 31, 9) are ubiquitous. The bone arrowpoints (Fig. 32, *5, 6, 7, 13*) are typical Western Thule types (Mathiassen, 1930, Pl. 9, *1-3*, Pl. 18, and 1927, Pt. II, p. 45 ff.); de Laguna (1947, pp. 199, 276, 9). Even the long-barbed copper point (Fig. 31, *10*) is not rare. Nelson illustrates a similar head (1899, Pl. 61, *a-11*).

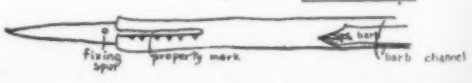


FIG. 33. Blow River grave 3 harpoon details.

Scapula scrapers (Fig. 32, 2) are illustrated by Jenness (1946, p. 84, Fig. 89) for Eskimo to the east and by de Laguna (1947, p. 258, Pl. 15, 24, 25) from the west.

Thus, Western Thule forms comprise a large part of the collection. The graves and implement types and house types correspond closely with much of Stefánsson's material. The bow, the rivetless arrowheads in the barbed bone foreshaft, rifles and labrets in the graves, sleds and boats on the graves, the east to southeast orientation of the body, added to Stefánsson's and Murdock's material, all indicate a close cultural continuity from Point Barrow to the Mackenzie. Differences arise as one moves east toward the Central Eskimo.

With the exception of grave 8, all of this material can be reasonably assigned to the latter half of the 19th century and probably the first decade or so of the 20th. Graves 1, 3, and 5 could have been made anywhere from the 1850's to the 1890's. It must be remembered that preservation cannot be closely considered in the Arctic, also that the Blow River settlement is now almost wholly abandoned for Shingle Point.

Other than being a specialized description of one phase of the anthropology of a discrete area, this report has added a few facts to the general picture. The bark boxes and the type of the umiak-canoe are both of interest. The latter seemingly demonstrates an Athapascan influence on the coast.

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# THE MIDDLE COLUMBIA CREMATION COMPLEX*

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CREMATION PITS were discovered in the Yakima and Snake River valleys and on the Columbia at Wahluke and at The Dalles before 1927. Recently one has been described from the John Day region in Oregon by Cressman (1950). The cremation complex which the pits represent appears in the late prehistoric period and was undoubtedly widespread and important in the cultural development of the region. In the Dalles-Arlington area, at least, it lasted into historic times. Recent evidence associates the cremation complex with Sahaptin groups inhabiting the region above The Dalles until late historic times. This new evidence controverts an earlier theory, largely based on ethnological traditions, that the Salish were the early inhabitants of the area. The finding of burials below the cremation level at Sheep Island (i.e., a stratified burial site) has particular bearing on the problem.

## SHEEP ISLAND CREMATION PITS

Sheep Island (site 45BN55) is 13 miles downstream from Wallula, Washington. The island, about 300 yards long, is one of a series of islands which occur every mile or so along the Columbia River. Except for scattered rocks which cover the low beaches, the islands are composed almost entirely of fine sand, their higher parts often being dunes and flats stabilized by vegetation. The two cremation pits were near the west or downriver end of the higher portion of Sheep Island, where the sand rises about 20 feet above the rocky beach. They were shallow depressions 6 to 8 feet across and a foot or less deep, with cremated bone only an inch or two below the surface. Each pit was surrounded with a wide ring of stones. The ring around the westernmost pit, called pit 1, was nearly 14 feet in diameter, the inside diameter being approximately 6 feet. Additional rings of rock occurred, one at a 10-inch depth and the lowest at about 18 inches, there being layers of calcined human bone between. The under faces of the rocks were soot covered as if they had been placed around the pit while the recently cremated bones were still smoldering. The upper face of a stone on the southwest side of the middle ring was painted with red ocher. It seems probable that cremations took place at least three times. Each time the burned bone, charcoal, etc., was swept into the pit and then covered with a ring of stones. The fire must have been intensely hot, for bits of sand had fused, sometimes adhering to the bones and artifacts. When completely excavated the pit resembled a truncated cone, 4.8 feet in diameter at the bottom, 13 feet in diameter at the top, and 3.75 feet deep.

Pit 2, about 10 feet east of pit 1, exhibited similar characteristics, except that it was rectangular. The outside diameter of the upper stone ring was 15.5 feet, and there were one and possibly two other rings below. The pit formed an irregular rectangle at its maximum depth of 2.16 feet, where it measured 7 feet long by 6 feet wide, its walls being much less sloped than those of pit 1. Surrounding the pits was the old occupation level (cremation

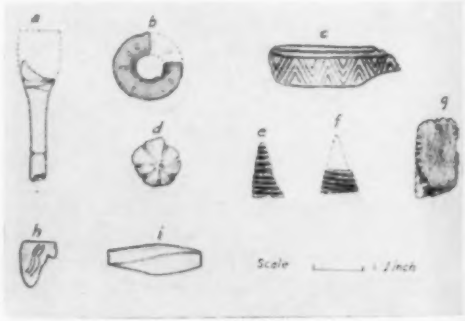


FIG. 34. Artifacts from the Sheep Island cremations. *a*, tubular pipe; *b*. sandstone ring; *c*, bone band from intrusive burial in pit 1; *d*, lenticular sandstone artifact, decorated on curved side: *e*, *f*, thin bone ornaments; *g*, slate pendant; *h*, bowl fragment of reddish sandstone pipe; *i*, tubular stone bead.

*This report was made possible by the cooperation of the Whitman College Museum and History Department with the writer, who was resident archaeologist for the National Park Service in Walla Walla, Washington. We are deeply indebted for the voluntary assistance of professors and students as well as amateur archaeologists in the vicinity. Appreciation is also tendered the Corps of Army Engineers for assistance on many occasions, and to John Champe and Frank Fenenga at the University of Nebraska and Doctors Gunther and Osborne at the University of Washington for criticism of the manuscript.

floor), now covered by 18 inches or so of windblown sand. This floor was highly compacted, and on its surface was a thin layer of calcined bone which diminished in amount as one worked away from the pit. On the occupation floor were some of our best finds, including a 7-inch-long knife (burned) and a 2-inch-long sandstone bead. Below the floor were a number of primary burials, to be described later.

The burned flinty implements had turned a brittle chalky white, making it almost impossible to identify their material. Although the pits were excavated in 12-inch levels, the types of artifacts from each level were too few to make valid comparisons by level. We did note, however, that broken parts of the same implement tended to be on the same level, which supports the contention that there were several separate burnings for each pit, probably with a number of years between. Some of the bones had a thin coating of red ocher, indicating that the bodies must have been exposed, probably on a platform, and that after the flesh had disappeared the bones were painted. Additional evidence of exposure is the finding of a number of fragmentary "mud dauber" wasp nests, some showing the imprint of split planks or the curvature of bones on which they had been attached in the depository sheds or exposure platforms. The mud nests had been baked to a pottery-like consistency.

Distinctive artifacts occurred with the cremations. Small stemmed arrowpoints of basalt or flinty rock were abundant and differ little from those used by historic tribes of the area (Fig. 35). The 4 concave-based points from pit 1—called "mule ear" points by local collectors—may be a distinctive trait of the cremation culture. None have been found in such historic sites in the area as Berrian Island (45BN3) and sites 45WW5 and 45WW6 flanking the mouth of the Walla Walla River, although several were found at Juniper (Canoe) Island. These were not *in situ*, however. The points, typically about 50 mm. long by 38 mm. wide at the base (Fig. 35, *a-d*), have a wide distribution in the Plateau area. Double-pointed leaf blades often of basalt and large stone knives were also used by the cremation people (Fig. 35, *g*, *h*, *o*). An asymetrical knife (Fig. 35, *e*) has a short and slightly hooked blade similar to one shown hafted to a short handle in Teit's treatise (1900, p. 184) on the Thompson Indians. These were used for carving wood and are similar to the crooked knives used by coast tribes.

Two fragmentary soapstone pipes were found in pit 1. The most complete pipe is trumpet-shaped with a thin stem nearly 4 cm. long which gradually flares out to form the bowl, most of which is missing (Fig. 34, *a*). Decoration is a series of deeply incised lines circumscribing the bowl and stem. There is only enough of the second pipe to indicate a similar construction, although the only incising visible is a ring at the junction of stem and bowl. A fragment of a micaceous sandstone pipe bowl

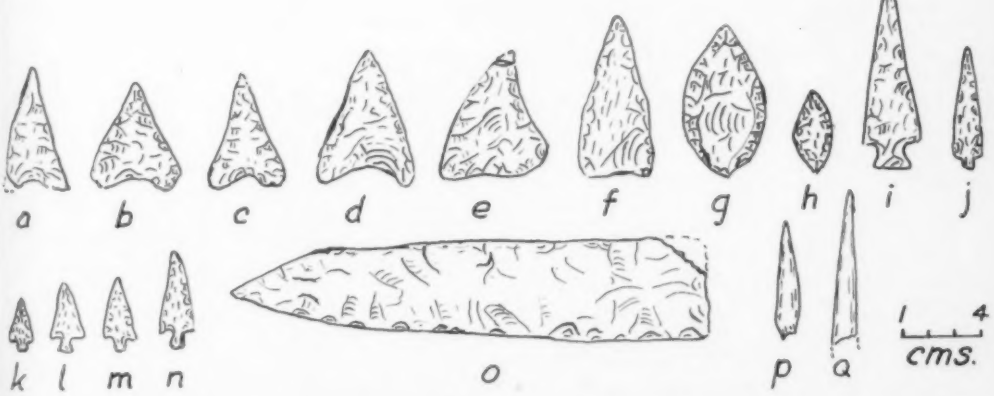


FIG. 35. Material from the Sheep Island cremation pits. *a-d*, mule ear points; *e*, crooked knife (?); *f-o*, points and blades; *p-q*, fragmentary bone points.

came from the cremation floor near pit 2. Its walls are extremely thin and are decorated with 3 parallel waved lines (Fig. 34, *h*). Pipes of the Sheep Island type were common in cremation pits at The Dalles, but lack incised decoration and have flared mouth pieces (Strong, 1930, pl. 24). Somewhat similar pipes were found at Wahluke (Krieger, 1929, p. 12) and at a prehistoric site near Kamloops, apparently also associated with cremations (Smith, 1900, pp. 428-9). Both these and some from the Puget Sound region have incised decoration (Smith, 1907, p. 350). In the Grand Coulee area one trumpet-shaped pipe was found at a prehistoric site (46), but the others found in the area are quite different (Collier, 1942, pl. 14). The one from historic site 8 is similar to those found at Berrian Island by Osborne (1949, pl. 3). It has a long thick body, a widely flared mouthpiece with ticks along the rim, and a hole drilled in the rim for suspension. It seems probable that this type of pipe was associated with historic Salish tribes who occupied the upper Columbia area (Ray, 1942, p. 188).

Ten pestle fragments, at least two from the same pestle, came from pit 1. Although there are no carved heads or knobs on the pestles, they do exhibit careful workmanship, being almost perfectly round in cross section and tapering evenly to a blunt point at the handle end from just below the middle.

Ornamental objects of stone include a flat slate pendant perforated at one end with engraved ticks along the sides, and a tubular bead of micaceous sandstone with an engraved line spiraling slightly from one end to the other (Fig. 34, *g*, *i*). Similar beads have been found at the "Bead Patch" at The Dalles (Seaman, 1946, pp. 80-1). A micaceous sandstone ring with an outside diameter of 34 mm. (Fig. 34, *b*) and with a near triangular cross section

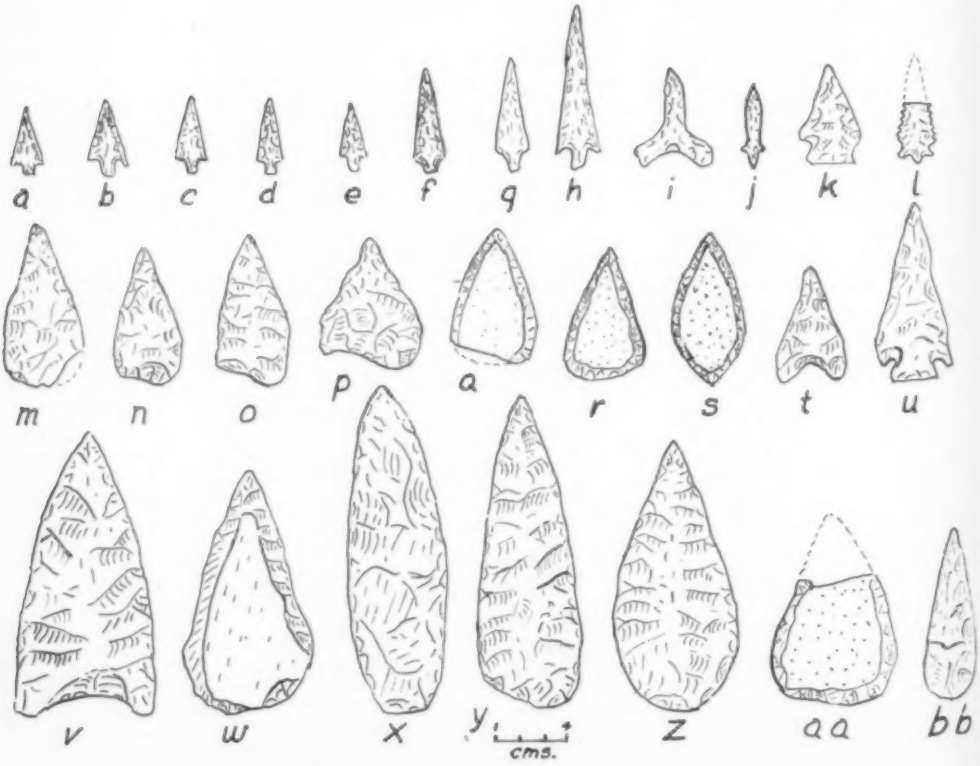


Fig. 36. Points and blades with burial 10, Sheep Island.

is also similar in some respects to examples from The Dalles. The worked face of the ring is notched at 6 mm. intervals. A crude petal-like design was incised on the concave face of a thin sandstone fragment (Fig. 34, *d*).

Objects of bone and shell include broken fragments of elk horn—presumably tools of some sort originally; the broken tip of a horn wedge; 10 fragments of flat, smoothly-polished implements or ornaments (one was perforated and may have been part of a long, flat, wedge-shaped bone pin—Smith, 1910, Fig. 58); a long gaming bone (Fig. 39, *d*)—possibly used in the 4 stick dice game as found among the Chinook, Klamath, and in northern California; the working end of a bone flesher with a chisel-like edge 27 mm. wide; and a number of bone points usually perfectly round in cross section and under 6 mm. in diameter. These points may originally have been needles, gorgets, projectile points or even harpoon points. There was one fragment (Fig. 35, *q*) of what may have been a long bone spear or arrowpoint such as were found at The Dalles and were used by the Nez Percé. Four slightly curved, bear penis-bone awls and a perforated elk tooth were also found. The 12 bird bone beads from pit 1 were 10 mm. or less in length with ends rounded by rubbing. Two flat triangular bone pendants were decorated with horizontal grooves (Fig. 34, *e*, *f*). Since there is no perforation for suspension, the pendants may have been tied in place at the narrow tip. Shell beads include 3 glycymeris perforated at the tip for suspension, 2 perforated olivella, and 14 dentalia shells cut into segments 6 to 12 mm. long.

FIG. 37. Artifacts from Sheep Island and vicinity. *a*, so-called salmon packer from burial 10; *b-c*, pestles with burial 4; *d*, small pestle from the historic level at site 35UM15-b; *e*, shouldered maul from burial 10.

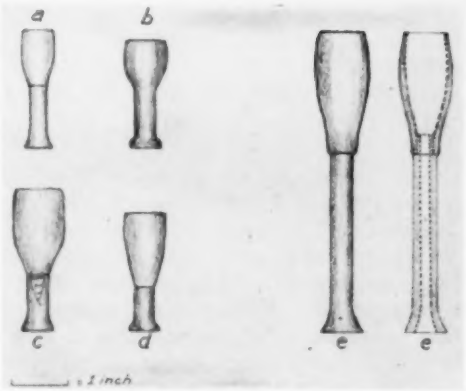


FIG. 38. Pipes with burial 10, Sheep Island.

Also in the pits were several small fragments of red ocher, a sandstone smoother, and a pencil-sized piece of petrified wood in the half round, 2 cm. long, and rubbed to a high polish. A similar but longer piece was found on Juniper Island by a local collector. Its use is problematical.

## RABBIT ISLAND CREMATION

A cremation pit similar in many respects to pit 2 at Sheep Island was discovered near the southeast end of Rabbit Island (site 45W-W15), which is about one mile south of the mouth of the Snake River. This small island shows signs of intensive occupation at its downriver end, where there are a number of historic, rock-covered burials on a low rise. About 60 feet to the north was the cremation pit surrounded by an indefinite stone ring 16 feet or so across. When excavated the pit proved to be rectangular—4.42 feet wide, 7.5 feet long (E-W), and 1.67 feet deep. It had been disturbed, and the only cremated bone left *in situ* was what had been missed near the floor of the pit, which showed signs of burning. Mixed with the scattered bone were bits of charcoal, fragments of two charred baskets, and some charred willow rods twined together with string—possibly rod armor which was common in the area (Mason, 1904, p. 341). One of the basket fragments—possibly a basketry hat—showed a "bundle of warps" base and what may have been an overlay element. Fine string about 1 mm. diameter served for both warp and twining elements. Similar

string-twined basketry was found in a cremation pit on the Snake River about 20 miles away (Weltfish, 1932, pp. 113-14). Thicker apocynum cord was used in soft-twined bags and baskets by modern Plateau tribes such as the Nez Percé, Palouse, Wishram, and Coeur d'Alêne. Also in the Rabbit Island pit were portions of a two-strand rope 8 mm. in diameter, cord fragments 3 mm. in diameter, the tip of a broad antler wedge, and a baked "mud dauber" nest. This last probably indicates, as at Sheep Island, that the remains had been on an exposure platform.

At a 1.16 foot surface depth and one foot south of the southwest corner of the pit was a charred plank, 6 inches wide, oriented east and west and covering a child's burial. Little remained of the decayed bones, though the head portion appeared to be toward the west (with much red ocher) suggesting a primary burial. There were no grave goods. The sand in and around the burial and the borders of the pit was much compacted. Crabtree (personal communication) recently discovered a number of extended burials on Rabbit Island apparently also in this same hard packed layer, but more to the west. The abundance of red ocher with these burials suggests a similar type and origin to ours. All are probably older than the cremation.

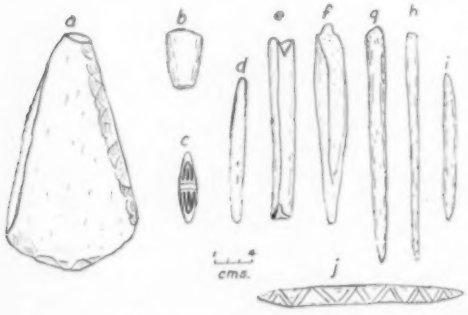


FIG. 39. *a*, basalt hand adze from Juniper Island; *b*, seismotite pipe from site 45WW5; *c*, hand game bone, site 45WW6; *d*, gambling bone from a cremation pit on Sheep Island; *e-i*, bone artifacts from burial 10, Sheep Island; *e*, haft for a harpoon or other point; *f*, [illegible] wedge; *g-h*, projectile points; *i*, double-pointed bone, possibly used in gambling; *j*, bone used in dice game from Fort Walla Walla.

## THE SUNDALE CREMATION

Sundale is on the north shore of the Columbia River, nearly opposite Arlington, and 78 miles below Wallula. Here on a slope 200 feet or so above the river is a burial area containing several historic cist burials which have been rifled by local collectors. Broad split cedar planks which had apparently lined the cists were lying about and trade material lay adjacent to one recently plundered cist grave. The usual thick ring of rocks about 15 feet in diameter surrounded the nearby cremation pit. It contained a wooden box oriented east-west and about 6 feet long by 31 inches wide of both split and sawn boards. The box rested on two layers of matting, one running crosswise of the other, and below were 3 thicker supporting planks running parallel with the box. Obviously the remains had been cremated elsewhere and then buried in the box. The custom of wrapping a corpse or coffin box with matting is still practiced by Sahaptin peoples such as the Palouse and Umatillas, who use the same type of sewn tule matting that appears to have been used at Sundale. Red ocher stained bone and one small fragment of a mud dauber nest indicate previous exposure of the remains. Mixed with the cremated bone was an enormous quantity of trade material—copper tube beads, broken pieces of copper, glass beads often partially fused by heat, square nails, charred cloth, buttons of brass, bone and mother-of-pearl, a Phoenix button (see Strong, 1930, pp. 64-5), and an 1840 (or 1848?) dime (U.S.) perforated and fire blackened. The scanty material of Indian origin included a few dentalia and clam shell disc beads, a perforated bear claw, and two perforated elk teeth.

The correlation between rock-encircled cremation pits and exposure of the dead seems to be borne out in other areas. Seven of the eight (precontact) pits reported by Smith (1910, pp. 157-60) near the mouth of the Natches River in the Yakima valley contained group cremations, and only one seems to have contained a single individual. Seven of the pits were surrounded with a ring of stones, and the eighth with a stone rectangle. Smith says of his grave 15 (1910, p. 158): "The whole cremation circle seemed to have been the burned remains of a communal or family depository for the dead, probably a hut like an underground winter house walled around the

edge of the roof with stones." He was probably correct in inferring that this was the burned remains of a depository for the dead, but his inference that the pit was part of an underground house is subject to considerable doubt. It seems apparent that what he actually had was a cremation pit of the Sheep Island type, especially since there were three separate rings of rock at different levels around the pit indicating possibly three separate burnings as at Sheep Island. This close similarity suggests that exposure sheds or platforms of the type inferentially employed at Sheep Island were used here also.

At Wahluke near Priest Rapids, Krieger found an exceptionally large number of cremations. He states that in the instances in which several individuals were burned at the same time (group cremation), the parts of several skeletons were jumbled all in a heap (Krieger, 1929, p. 10). Thus it seems probable, as Krieger suggests, that the bones had been on an exposure platform, possibly in a depository shed, before being burned. Individual ceremonial cremations of the cist type were also common at Wahluke. In such cases the body was evidently burned soon after death, it being flexed as in a primary burial. Judging from similar burials and cremations, broad cedar boards must have been placed vertically against the walls of the pit to form a cist. Caywood (personal communication) reports cist-type cremations at the Priest Rapids area. Krieger does not list his artifacts according to the type of grave in which they occur and it is impossible to judge whether those with the individual cremations were of a different type than the others. In the McNary area the post-exposure type of group cremation is older (Shiner found an individual cist-type cremation at Berrian Island in an early historic site) and it would not be surprising to find a similar situation at Wahluke. The numerous rolled copper tube beads at Wahluke probably came primarily from the individual cist burials or cist cremations. Their occurrence as well as the numerous copper pendants, etc., suggests European influence.

Information on the Snake River cremation pits is meager. Krieger (1928, p. 138) states that the cremations found here are of the usual group type. Thus we can probably assume that they are similar to the group cremations at Wahluke and in the Yakima valley. I have recently learned of a cremation pit located 40 miles above Lewiston on the Snake River, and presumably if our correlation holds the exposure sheds were used here also.

The modern Wishram (Chinookan stock) at The Dalles were using depository sheds as late as 1927. They explain the cremation pits as occurring from the burning of depository sheds (Strong, 1930, p. 48). This, added to the archaeological data, gives us nearly conclusive evidence for the association of the cremation pits with the sheds. In fact, according to Spier and Sapir (1930, p. 271) the Wishram depository sheds were placed over shallow pits! More than likely after a shed became filled up, it was burned, the burned bone and artifacts falling into the pit below. This would explain the occurrence in Sheep Island cremation pits of burned mud dauber nests, at least one of which shows a flat impression as if from a plank. It also explains the exceptionally packed condition of the ground surrounding the pits as well as the rectangular shape and east-west orientation of 3 of the 4 pits we excavated.

## Distribution of Depository Sheds

Although the use of depository sheds for the dead was common along the Columbia in early historic times, it is difficult to prove that any specific ethnic group practiced cremation, and even the occurrence of the sheds above the Umatilla River has not been recognized. The following is a description by Lewis and Clark of a Chinook-type shed on or near Blalock Island about 30 miles below Umatilla, Oregon.

> . . . on the upper part of this Island we discovered an Indian Vault, our curiosity induced us to examine the method those nativs practiced in depos(it)eing the dead, the vau(l)t was made by broad poads (boards) and pieces of Canoes leaning on a ridge pole which was Suported by 2 forks Set in the ground six feet in hight in an easterly and westerly direction and about 60 feet in length, and 12 feet wide, in it I observed great numbers of humane bones of every description perticularly in a pile near the center of the vault, on the East End 21 Scul bones forming a circle on Mats: in the westerly part of the Vault appeared to be appropriated for those of more resent death, as many of the bodies of the deceased (w)raped up in leather robes, lay (in rows) on board(s) covered with mats, &c (when bones & robes rot, they are gathered in a heap & sculls placed in a circle) we observed, independant of the canoes which served as a covering, fishing nets of various kinds, Baskets of different Sizes, wooden boles, robes Skins, trenchers, and various kind of trinkets, in and

suspended on the ends of the pieces forming the vault; we also Saw the Skeletons of Several Horses at the vault a great number of bones about it, which convinced me that those animals were Sacrefised . . . to the Deceased (Thwaites, 1904-5, vol. 3, pp. 139-40).

There seems to have been a gradual progression of the bones through the sheds, from east to west. The final act was either secondary burial or cremation. Sometimes Chinook exposure sheds, which were about 10 feet square, were placed end to end, producing a long structure comparable to the one on Blalock Island. It is not improbable that the sheds over pit 1 and pit 2 at Sheep Island were placed end to end in this fashion, as the pits were in an east-west line and were about the proper distance apart. In two of the historic group-type secondary burials and in one primary burial at site 45WW6 fires had been built in the pits before interment, a practice that could be a survival from earlier cremation. We also have evidence from several sites that cremation lasted at least into the early historic period in the area.

It is highly probable that the Walla Wallas (whom Lewis and Clark list as being in the area at the time) or a related Sahaptin group built and used the Blalock Island depository shed. The Nez Percé, Palouse and probably the nearby Umatillas (Walla Wallas?) practiced some exposure in depository sheds in historic times. Townsend (Thwaites, 1904-6, vol.

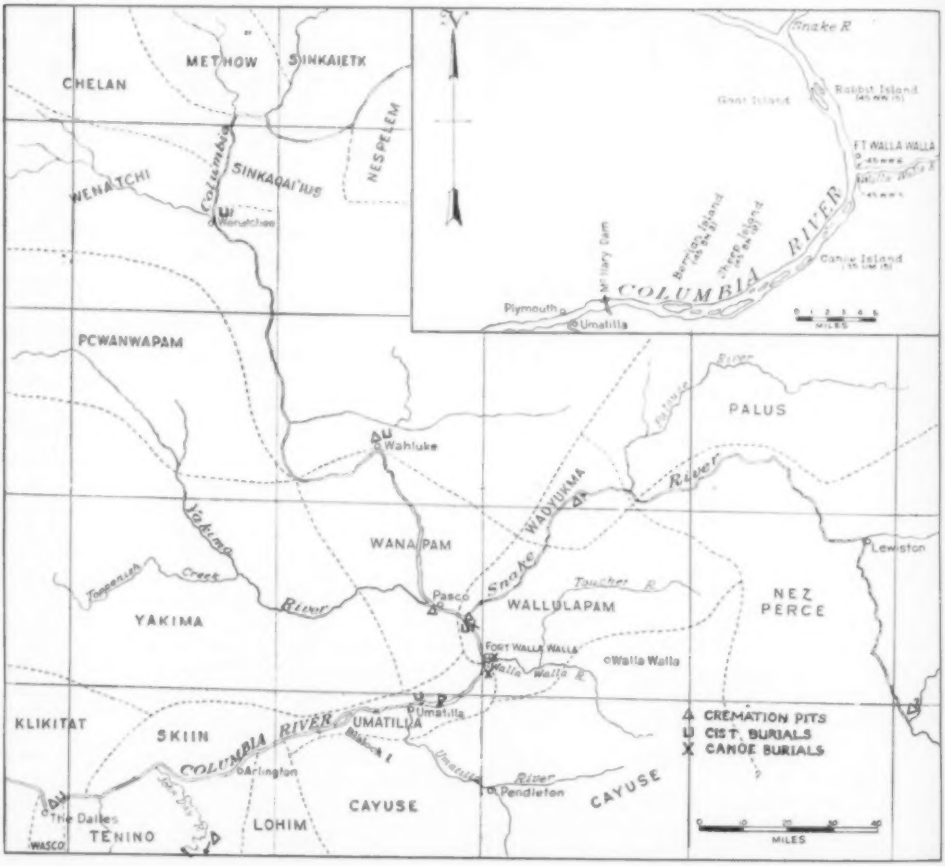


FIG. 40. Archaeological sites superimposed upon a tribal distribution map along the middle Columbia and lower Snake rivers.

21, p. 282) described what may have been Umatilla sheds in 1834, three years after one of the recurrent epidemics had taken its toll, and 30 to 40 miles downriver from Fort Walla Walla.

> We have observed today several high, conical stacks of drift-wood near the river. These are the graves of the Indians. Some of these cemetaries are of considerable extent, and probably contain a great number of bodies. I had the curiosity to peep into several of them, and even to remove some of the coverings, but found nothing to compensate for the trouble.

Townsend may have meant shed-like rather than conical structures, as the former would be much more in keeping with the area. The coverings he speaks of were probably the skins or mats in which the bodies were wrapped before being put into the shed.

We get a much better description of the sheds among the Nez Percé and Palouse along the Snake River by Lewis and Clark (Coues, 1893, vol. 3, pp. 1017-18).

> The Chopunnish (Nez Percé and Palouse) bury their dead in sephulchers formed of boards, constructed like the roof of a house. The bodies are rolled in skins and laid one over another, separated by a board only, both above and below. We have sometimes seen their dead buried in wooden boxes, and rolled in skins in the manner above mentioned. They sacrifice their horses, canoes, and every other species of property to their dead; the bones of many horses are seen lying around their sephulchers.

Above the confluence of the Clearwater and the Snake only burial was practiced. The grave was covered with stones and finally a board roof (probably Chinook style) was erected over the grave (Thwaites, 1904-5, vol. 5, p. 99). As many as 28 horses might be sacrificed at a grave. Thus in 1806 the Nez Percé and Palouse were practicing both exposure in depository sheds and burial in wooden boxes. It is not improbable that exposure of the dead was already beginning to be discontinued, for missionary and other accounts from 1820 on give no hint that exposure was practiced. The Nez Percé seem to have been gradually adopting the Salish type of hollow burial as found among the Flathead.

Our experience with historic burials was mainly in the area of the Walla Wallas (Wallulapum) who are closely related to the Nez Percé both linguistically and culturally. Since they are midway between the Blalock Island exposure sheds and those reported for the Nez Percé, evidence that they formerly practiced exposure would be highly expectable. Burials were encountered at 45WW6, a well-known Wallulapum village, and 45WW15—also no doubt used by the Wallulapum. Out of 10 individuals discovered, only one, a 7 year old child, was a primary burial. With it were trade goods of the 1850-60 era. Unfortunately we cannot judge whether or not any of these individuals had first been exposed, as the Wallulapum practiced reburial in more recent times. (Two or 3 years after a burial the bones were dug up and reburied.) The skulls were apparently most important, for in the burials we encountered, many of the other bones were missing. This is reminiscent of the situation at Blalock Island where the skulls were given preferential treatment. Three of the graves, one a canoe burial, contained 2 or 3 individuals, and it seems that this might be more likely to result from burial after exposure than from reburial. However, there is no proof of this, nor does historical evidence help us here.

The Wallulapum have features in ethnological accounts of their burial customs, however, which strongly indicate that exposure with its accompanying ideology was practiced at some time in the past. The body was placed extended in a well dug out grave or in a canoe and poles (or half of the canoe, which was cut in two at its middle) were laid over the corpse, beside which was first placed a small drum and beater. Earth was then heaped over the poles, leaving a hollow grave, as the covering soil was not supposed to contact the body. Relatives then visited the site from time to time intending to dig up the corpse should he signal by beating the drum that he had returned to life. The fear of being buried alive is very strong. There are many stories of people dying and returning to life after two or more days, and usually a burial does not take place until three or more days after death. This ideology is much more compatible with exposure than with burial. There is a certain irrationality about the procedure, for although they ostensibly expected the individual to beat the drum on coming to life, they bound him tightly in a skin blanket or mat. Actually the recent burial practices of the Wallulapum involve almost the same treatment of the corpse as was given earlier (by the Nez Percé, Chinook, etc.) to bodies in exposure sheds. There

was the same type of wrapping; the body was laid out in the same extended position on the back; and there was the same readjustment of the bones after a time (they might be put in a new blanket) as was practiced in exposure sheds. The chief difference was that the bodies were put underground. Actually this almost amounts to "exposure" underground. The frequent use of canoes to contain the body reflects the coastal practice of exposure in canoes, the difference again being that the Wallulapum placed their canoes underground. Thus, there seems little doubt but that the Wallulapum, and probably also the Yakima—who have similar burial practices—at one time exposed their dead.

### Burials at Sheep Island

From 3 to 15 feet east and north of pit 2 on Sheep Island and at a depth of from 12 to 18 inches we encountered the packed sand floor representing the occupation level during the cremation period. There is little evidence that the pit area was a camp or village site or that the compaction, extending to a depth of 7 or 8 inches, is any greater than would occur from occasional use of the area. However, the fact that exposure sheds were situated over the cremation pits would partially explain why the area surrounding was so compacted by foot traffic. There is also a possibility that ceremonials of some sort were carried on here. Underneath the packed cremation floor 9 burials were found. These must date before the time of the cremations as the cremation floor extended over them without a break. Our technique in exposing the burials was first to uncover a section of cremation floor and then to dig below for burials. Burials 2 to 10 were below the cremation floor. Burial 1 was found earlier near the south border of pit 1 and intrusive in the pit. It was a child whose bones were badly decayed. We were unable to discover whether it was a primary or secondary burial. No doubt it postdates the cremation pit. With it was an engraved bone band (Fig. 34, *c*).

*Burial 2.* A child whose bones were badly decomposed and displaced, possibly by rodents. The skull seemed to be to the west, though this may not have been a primary burial. The remains were from 8 to 10 inches below the cremation floor.

*Burial 3.* A secondary burial of an adult male with some of the bones missing and no accompanying artifacts. This burial, which was on the same level as surrounding burials, could have been intrusive through the cremation floor, but was probably not. Some of the bones had been slightly burned.

*Burial 4.* An adult female lying flexed on her back with the head southeast and chin on the chest. Two nicely made pestles lay side by side 10 inches northeast of the skull and an ovoid shell pendant was in the oral cavity. The skull was only 5 inches below the cremation floor.

*Burial 5.* An adult female (?) about 3 feet north of pit 2. The upper rock ring of the pit extended over the burial. Below the ring and 13 inches above the skull, 4 rocks (about 8 inches in diameter) formed a tight semicircle, surrounding a burned area and a charred elk (?) bone. Possibly this was a food offering. The skeleton lay on its right side with the skull to the west, facing up and south. The legs were flexed and the hands were clasped over the stomach. There were no grave goods.

*Burial 6.* A flexed adult on its back with knees to the east and head south. It was 18 inches below the cremation floor and 3 feet east of pit 2. This was probably a female, judging from the two fragmentary pestles (killed) flanking the head. However, split planks about 6 inches wide had been placed over the body before the dirt was heaped on, and the weight of the dirt had badly crushed the remains. A chalcedony point and an asymetrical blade (crooked knife?) lay adjacent to the right tibia.

*Burial 7.* An adult male on its back, hands folded under the chin with the legs flexed and to the northeast. The head was to the west and the face up. On the alveolar region was a rectangular shell pendant, and on the wrist a small basalt arrowpoint, with another on the left tibia. The cremation floor came within 4 inches of the top of the skull and the soil around the bones was much packed.

*Burial 8.* An adult male (?) in the typical flexed position—on the back, the face up, head to the west and knees to the north. An oval of vertical planks 5 or 6 inches wide, surrounded the burial, their tops first showing about 3 inches below the cremation floor. They extended only slightly below the top bones of the burial and were probably driven in after the burial was covered over. There were no burial goods. In this and other uncrushed adult skulls, there was marked occipital flattening.

*Burial 9.* A child flexed on its back on the decayed remnants of a skin blanket or mat. The skull was to the west and was badly crushed; on the alveolar region was a rectangular shell pendant. The burial was 21 inches below the cremation floor; four inches below it were several blades belonging to a somewhat deeper burial (10) which was a short distance to the north.

*Burial 10.* An adult male who must have been of some importance in the tribe. Like most of the others he lay flexed on his back with his head to the west and

hands over the stomach. The bones were in rather poor condition. This was the richest burial at the site, there being 55 associated artifacts, most of which lay in a 12-inch wide strip from the right shoulder to below the pelvis. Many were purposely broken before being placed in the grave.

Among these was a nicely made shouldered maul 23 cm. long with a decorated raised portion at the handle end which tapers in 3 concentric steps to the button-like tip. Each step is decorated with vertical incising, and just below the shoulder is a band of incised triangles (Fig. 37, *e*). Both this and a large pestle-like object, known locally as a "salmon packer," had been broken. The tip shows the same concentric steps as the maul, but much less well defined; the length is 38.8 cm. (Fig. 37, *a*). Implements probably of the same class are depicted by Smith (1910, Figs. 30, 33-35) from the Yakima valley. These are extremely long and highly decorated. Our finding of such a decorated pestle with an important male may indicate that these implements had some special use or even ceremonial significance.

There were 5 tubular pipes, 2 of which had been broken. Pipes *c*, *d*, and *e* in Figure 38 are two-piece pipes with the stem made separate from the bowl. A constriction at one end of the stem fits into the base of the bowl, though not snugly. The mouthpieces are flared, and the bowls show a slight incurve near the rim, which is fairly thin. Specimen *e* is 140 mm. long; the others range from 63 to 48 mm. in length. Pipe *c*, of reddish sandstone, is the only one decorated. Incised on opposite sides of the stem are 2 cross-hatched triangles. The other pipes are of steatite. What is probably the stem of a similar two-piece pipe is shown from a cremation pit at The Dalles (Strong, 1930, pl. 24, *d*), but no complete pipes of this type were found. However, West (1934, pl. 13, Fig. 1) shows a two-piece steatite pipe from The Dalles area. The pipes from The Dalles cremations are remarkably similar to those from burial 10 in shape, size and in the type of flared mouthpiece. Probably the short pipes were used with long wooden stems.

The 30 blades and points with burial 10 vary considerably as to type. In Figure 36, blades *n*, *o*, *p*, and *y* may have been triangular side blades, having slanted bases and slightly convex lateral edges. Concave-based blade *v* (Fig. 36) is exceptionally well made, having several ripple flakes extending across its entire width. Its thickness was under 5 mm. The concave based "mule ear" point, *t*, indicates relationships with the cremations, where such points were common. Osborne found three more of these points in burials which he later excavated at the site, and which he will eventually report. Incidence of materials used for points are as follows: Chalcedony—8, jasper—5, agate—2, sheet quartzite—4, chert—3. Five of the blades were broken, making identification of type difficult. Those of basalt were crudely chipped. Figure 36, *j*, may have served as a gorget for fishing. It is a thin blade of agate 17 mm. long tapering in slightly at the center, just beyond which are two nubs, possibly to hold the string in place. Miscellaneous items include 2 flat smoothing stones (sandstone) and some blanks of thin sheet quartzite material as well as 3 flakes of jasper, one of which was worked along one edge. This may indicate that the person here buried was an arrow maker. If so, some of the unidentified bone points may have been flaking tools.

There were 6 bone points from 188 to 102 mm. in length, an antler wedge, and a bone wedge with burial 10. Also found was a hollow bone object 148 mm. long with a V notch at each end but not in the same plane. This may have served as a haft for a harpoon or other point (Fig. 39, *e*). In addition there was a flat bone mesh measure 120 mm. long by 37 mm. wide and 2 hand game bones 55 mm. long, somewhat tapered and rounded at the ends. Similar specimens occurred, one at an 8-inch depth at site 45WW6 (Fig. 39, *c*), and in The Dalles cremations, both contact sites. The Sheep Island examples show no marking due possibly to decay of what may have been the marked face.

With burials 2 to 9 there were fewer articles. There were 4 pestles, fully as nicely made as those in the cremation pits. The longer pestle with burial 4 is of basalt with a slight greenish cast and an indefinite, phallic-like knob on the highly polished handle end (Fig. 37, *c*). The other pestles are of granitic material and have not been polished. The paired associations of long and short pestles probably indicate a matched set, each pestle having a special function. The shell lip ornaments with three of the burials may be a distinguishing feature, though ornaments of this type occurred in historic Yakima valley rock slide burials (Smith, 1910, p. 98) and at Fort Walla Walla. One Sheep Island lip ornament is 23 mm. square with 3 holes drilled along one edge, 2 of which have broken out; the second is 20 mm. long by 12 mm. wide with a single perforation near one end; the third is ovoid and about 18 mm. long.

In a comparison of the burial and cremation components at Sheep Island, the scarcity of red pigment with the burials is perhaps their chief point of difference. Pigment (usually mercuric oxide) was common both in the cremations and in historic burials in the Wallula area. Other than this the two components are, in spite of a time differential, remarkably similar; both probably belong to the same focus. Ninety-one per cent of the cremation projectile point types were also found in the

burials, and 48 per cent of the point types with the burials were also found in the cremations. Similarities with points from other sites or groups of related sites were much lower, mostly being below 60 per cent. Other similarities include the cross-hatched triangle as a design motif, trumpet-shaped pipes, and rubbed bone implements some of which were probably harpoon points used with wooden barbs. The absence of polished celts in both the cremations and the burials may indicate that basalt hand adzes (Fig. 39, *a*) were used instead.

## Provenience of the Sheep Island Cultures

It is difficult to relate the Sheep Island material to cultural manifestations at nearby sites. In this we experience the common difficulty of equating burial and habitation sites. Point types from historic sites 45BN3 and 45BN53 (Osborne, 1949, pl. 4) show a moderately low correlation with the Sheep Island worked stone (Figure 41). The one site (35UM15-b) in which we obtained excellent stratification showed no marked cultural changes from the historic to the prehistoric levels, although there was a preponderance of triangular points in the lower levels. A second Juniper Island site (35UM15-a) 400 yards to the west showed a 12-inch-thick stratum of midden deposit when flood waters washed out 2 to 5 feet of overburden. The material here seems to belong to one culture period and has been called the Juniper Island focus. Traits include the use of paddle-shaped blades of basalt (the so-called hand adzes) which were probably used in canoe manufacture, basalt wedges, elk-horn wedges, flat sandstone polishers, both side-notched and stemmed arrowpoints (sometimes long and narrow) of basalt and flinty rock, bone arrow or lance points some of which were probably wood-barbed harpoon points, the lap mortar often showing use on both sides (probably used with a mortar basket), two-notched net sinkers made from round flat stone 8 cm. or less in diameter and often in caches of 12 or more, discoidal scrapers made from similar flat stones, the shouldered maul, pestles usually well-made and tapering evenly to a blunt point at the handle end, and large grooved net weights and hammerstones made from ovoid pebbles about 15 cm. long with a groove around the shorter diameter. Much of the animal bone in this stratum was deer, indicating a fair dependence on hunting. Mussel shells, though common, were not in heavy concentrations. No doubt fish was the main staple, although few salmon vertebrae were found. There was no trade or contact material. Site 35UM15-b, nearby, showed almost identical cultural material, but occupation here had lasted into the historic period. Basalt hand adzes were very common. The cultural similarity between the two Juniper Island sites makes it likely that one is the prehistoric and the other the historic manifestation of the same focus. Both Sheep Island components could and probably do belong to this Juniper Island focus, although more work is needed to prove this. It is notable that Osborne found a Juniper Island type hand adze slightly below a Sheep Island burial, although not in direct association with it. Also several "mule ear" points so typical of Sheep Island occurred on Juniper Island, but not *in situ*.

A number of striking similarities occur between Wallula sites and the Sheep Island burials. At site 45WW5 the broken handle of what must have been a shouldered maul was found with a terrace-like knob at the end almost identical to that on the Sheep Island maul (Fig. 37, *e*). Other traits in common are leaf-type double-pointed blades of thin sheet quartzite, hand game bones of similar shape and design (from 45WW6 and a Sheep Island burial excavated by Osborne), rectangular shell lip ornaments, and possibly two-piece pipes. The seismotite bowl of what may have been a two-piece pipe came from site 45WW5 at Wallula (Fig. 39, *b*) although the cone-shaped hole at the base suggests use of a hollow wood or bone stem rather than one of stone as in burial 10 pipes; possibly the pipe was broken before being completed. The above similarities can not all be fortuitous. Rather, they strongly suggest the relative stability of culture elements over a comparatively long period of time and form a strong argument for the lack of major culture change from the late prehistoric to the historic period.

The point classification based on shapes first devised by Wilson (1899) and later adopted by Gifford and Schenck (1926, pp. 80-1),

Strong, et al. (1930, p. 77), has been used (Fig. 41). The chief difficulty with this system is that dimensions of the specimens are not considered. To partially alleviate this difficulty, points disproportionately long or short in comparison to others in their class have been specially marked. For example, nearly all NA points are over 6 cm. in length. Thus, a point of this shape but 4 cm. or less in length is marked by an "s." SB and SC points are usually 4 cm. or less in length. Those exceeding 6 cm. in length are marked with an "L," etc. Since our sites lack true pottery, we must fall back on some other media for demonstrating refined cultural relationships. Probably the chief justification for point classifications is that they offer the best available medium for demonstrating these cultural relationships. In the present case the point totals for many of the sites are too low to make a statistical comparison of point types particularly valid. In the column below a simple comparison of percentages of similarity has been made in the hope that at least the stronger relationships or dissimilarities might be adumbrated. The Wallula sites have been treated as a unit, as they are all probably historic Wallulapum. There is less justification for treating the Juniper Island sites as a unit, as the material from here doubtless represents a variety of time periods. However, it was included as a control. Should high similarities to the Juniper sites occur, the comparative method used would be more subject to doubt than otherwise. The general similarities of point types throughout the Plateau which have existed for a considerable period of time will probably result in similarities of from 40 to 50 per cent or more. Similarities greater than 70 per cent, however, are much more likely to be indicative of special cultural relationships. In each of the paired sites below the number of points similar to

| | NAa | NAb1 | NAb2 | NAb3 | NAb4* | NAb5* | NBa | NBa1 | NBa2* | NBb | NBc | SBa | SBa*1 | SBb | SBc | SBd* | SBe* | SCb2 | SCb3 | SHa | SHb* | Total Points |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Juniper Is. (35UM15-a) | | | | | | | | 1 | | | | | 1 | | | | | | 1 | | | |
| 35UM15-b 0"-12" | 1 | | 1 | | | | | | | 2 | | 2 | 1 | | 1 | | | | | | | 15 |
| 35UM15-b 12"-24" | | | | | | | | | | | 1 | | | | | | | | | | | |
| 35UM15-b 24"-48" | | | | | | | 1 | | | | 1<br>1-s | | | | | | | | | | | |
| Sheep Island Pit 1 | 1-s | | | | | | | | | 4 | | | | 1 | | | | | | | | 22 |
| Pit 2 | 1 | | | | 1 | | 1 | 1-L | | | | 1-L<br>7 | | 3 | | | | 1 | | | | |
| Burial 10 | 1 | 2 | 2 | 1 | | 4 | 2 | | | 1 | | 1-L<br>3 | | 2 | 2 | | | 1-L | 1 | | | 27 |
| Burial 2-9 | | | 1 | | | | | | | | | | | 2 | | 1 | | | | | | |
| Wallula sites 45WW5 | 2 | | | | | 1 | | | 1 | | | | | | | | | | | | | |
| 45WW5 | | | | | | | | | | | | 1 | | 1 | 1 | | | | | | | 12 |
| Ft. Walla Walla | | | | | | | | 1 | 1 | | 1 | | | 2 | | | | | | | | |
| Berrian Is. 45BN3 and 45BN54 | 1 | | 2 | 1 | 1 | | 2 | 3 | 2 | 1? | 1 | | 1 | 1 | 1 | | 1 | 5 | | 2 | 1 | 26 |

FIG. 41. *Types added to Strong system.

types in the other site are given and also the percentage of similar occurrences in relation to the total number of points from the site.

| Sites Compared | Similar Points Number | Similar Points Per cent |
|---|---|---|
| Juniper Island | 7 | 47 |
| Cremation Pits | 16 | 73 |
| Juniper Island | 9 | 60 |
| Burials (Sheep Is.) | 14 | 52 |
| Juniper Island | 11 | 73 |
| Berrian Island | 10 | 38 |
| Juniper Island | 8 | 53 |
| Wallula Sites | 6 | 50 |
| Cremation Pits | 20 | 91 |
| Burials (Sheep Is.) | 13 | 48 |
| Cremation Pits | 15 | 68 |
| Wallula Sites | 7 | 58 |
| Cremation Pits | 14 | 64 |
| Berrian Island | 13 | 50 |
| Burials (Sheep Is.) | 15 | 56 |
| Wallula Sites | 8 | 67 |
| Burials (Sheep Is.) | 15 | 56 |
| Berrian Island | 14 | 54 |
| Wallula Sites | 10 | 83 |
| Berrian Island | 9 | 35 |

The most marked similarity occurs between points from Sheep Island burials and those from the cremations. The similarity between Wallula sites and Berrian Island seems also to be significant. Some of this is no doubt due to the fact that both are historic. Also there is the fact that we are comparing a site with a low point total with a site having a high total. In such cases the chances of getting a high similarity are much increased. The similarity of cremation material (high point total) to that from Juniper Island may also be significant, especially since the point total for the Juniper Island sites is low. However, this high percentage may merely reflect the weakness in our method of comparison. The similarity between Juniper Island and Berrian Island is less significant since we are comparing a site with a low point total with one with a high total. The percentages above are not to be taken as indicating absolute point relationships. Only when we get high point totals for each site can there be an appreciable degree of validity in the method of comparison.

It is apparent that the Sheep Island and Wallula culture manifestations are decidedly different from that of the historic cedar cist people found near Sheep Island by Osborne (1949) and Perry (1939). The artifacts accompanying the cedar cist burials are frequently different from those from Sheep Island and are probably of Columbia Salish origin. The cedar-lined grave cists, the polished celts, the thick-stemmed heavy pipes, the numerous sandstone arrow smoothers, etc., all point to close affinities with the Salish of the upper Columbia. In 1805-6 Lewis and Clark report bands or villages of Salish and Sahaptin peoples interspersed along the Columbia from The Dalles to the Snake River. Tribal boundaries seem to have been vague, and the whole situation suggests the recent arrival of many of these groups. Salish traditions state that the Sahaptins (the Tenino, Wyampam, Klikitat, and Umatilla) excepting possibly the Nez Percé, Palouse, and Walla Wallas are recent comers to the Columbia region (Teit, 1928, pp. 97-108). They consider themselves to have been the earlier inhabitants. Yet it is highly probable that many if not all of the Salish were also late arrivals in the area. Lewis and Clark, for instance, found Tushapaws (Flatheads or a band thereof) wintering near the headwaters of the Clearwater River, their home territory, in 1805 (Thwaites, 1904-5, vol. 3, pp. 52-4). In January 1812 Hunt encountered Toustchipas, possessing a typical horse culture, wintering along the Umatilla River. Hunt also described another Salish (?) group called Akiechies on the shores of the Columbia near the mouth of the Umatilla River (Rollins, 1935, pp. 302-4). Earlier Lewis and Clark failed to mention these Akiechies on either their trip down the river in the fall of 1805 or when returning upstream in the spring of 1806. Instead they tell of Walla Walla lodges above and below the mouth of the Umatilla. Teit (1928, p. 94) says that the Akiechies were probably the same as the Stia'kEtux or Tia'kEtux who, according to Salish informants, lived along the Columbia above and below the mouth of the Yakima River—possibly extending at one time as far down river as The Dalles. These may be the cedar cist people found by Osborne at Berrian Island.

Again the Plateau Salish tell of a group called the NekEtEméux—probably a division of the Thompson Salish in British Columbia —who, after a quarrel, went down the Columbia and settled at The Dalles about 150 years ago (Teit, 1928, p. 96). Salish informants

agree that their language was closely akin to that of the Thompson Indians. Lewis and Clark do not mention this group, yet they are mentioned by Alexander Ross—who was in the area from 1810 to 1821—as living at and above The Dalles (Ross, 1855, vol. 1, p. 186). This may be evidence for their arrival after 1806. In any event, they seem to be recent comers to The Dalles area. Fifteen miles below Umatilla Rapids Lewis and Clark encountered 24 lodges of Pishquitpahs (Thwaites, 1904-5, vol. 3, p. 137; vol. 4, p. 321). Both Coues (1893, vol. 2, p. 649) and Thwaites (1904-5, vol. 3, p. 137), who probably used the Lewis and Clark vocabularies obtained from tribes along the river, list these people as Salish, being a branch of the Pishquow tribe. Mooney, on the contrary, calls them Sahaptins, being part of the Yakima group called Piskos who lived near the mouth of Toppenish creek (Spier, 1936, p. 16). Actually since many of the Pishquows (Wenatchi) in the Yakima valley were absorbed by the Yakima, it would appear that we had a former Pishquow band who had by Mooney's time lost its language and adopted that of the Yakimas. The main body of the Pishquows was in the Priest Rapids area of the Columbia and to the west in 1812 and probably before (Thwaites, 1904-6, vol. 7, p. 147). The Pishquitpah are most likely a branch of this group that had settled lower down along the Columbia. Another group closely related to the Wenatchi (or Pishquows) was a short distance below the Pishquitpahs opposite the present town of Arlington (Thwaites, 1904-5, vol. 4, p. 320). These were the Met-cow-we, the Mithouies (of Winans), or Methow. According to Spier (1936, p. 15) the main body of this tribe was north of the Wenatchi in north-central Washington in the early nineteenth century. The Pishquitpahs, and probably also the Met-cow-wes, were true horse Indians. Clark's map lists the Pishquitpah population as 2600 and Lewis says that they could raise 350 men (Thwaites, 1904-5, vol. 3, p. 137). Since these groups were encountered both in the fall of 1805 and spring of 1806, it is unlikely that seasonal migration can account for their presence in the area. Thus out of five Salish groups on the Columbia between the mouth of the Snake and The Dalles, at least four have strong northern affinities and (with the NekEtEméux a doubtful exception) a well developed horse culture, making it highly probable that they arrived in the area rather recently. True river Indians did not have such a highly developed horse culture. The Akiechies, who have the least pronounced northern affinities and whose culture seems to have been less affected by the horse, could have been the original Salish inhabitants of the area as Teit suggests. Yet even their presence in the McNary area before 1811 is suspect. They could very easily have been Salish of the Priest Rapids area who moved downstream.

The arrival of the Salish in The Dalles-Snake area in early historic times and their later disappearance from this area could easily account for their traditions of being the original inhabitants of the area. The early epidemics of 1781 and possibly before apparently left a population vacuum on the Columbia which promoted an ingress of alien tribes and a shifting of the indigenous peoples. The apparent amity of Salish and Sahaptin groups who inhabited the same area during this period is remarkable. Conceivably this might have resulted from religious causes, such as the introduction of a ghost cult after the epidemics. Also persecution by the Shoshone may have had a consolidating effect. The absence of the Columbia River ghost art (figures with the ribs delineated; Strong, 1945) in the precontact upriver cremations argues for its recency and suggests that it was connected with a religious cult following the epidemics.

Archaeological evidence for a recent Salish migration is found in the occurrence—in the Yakima and Columbia valleys from The Dalles north—of rock slide graves and cist-type graves lined with cedar boards or rock, usually containing contact material. The grave types are characteristic of the Middle and Upper Columbia Salish (Teit, 1928, p. 127; Collier, 1942). The cist-type graves may well be related to the cairns of British Columbia and Puget Sound, and the rock slide graves may be variants of the cist type. At The Dalles, for instance, the rock slide graves were sometimes boxed in with cedar boards. Again, the rocks might be arranged to form a cairn-like enclosure such as the one at Tampico in which Smith (1910, pp. 133, 160-1) found a carved figure with Plains-type dress, showing the well-defined ribs typical of the Columbia ghost art. It is highly probable that these finds are the result of a Salish migration into the Yakima

area in early historic times and that their predecessors, probably of Sahaptin stock, exposed and cremated their dead and possessed a somewhat different material culture.

## Summary and Discussion

There is much to indicate that the group cremation complex was associated with long-time Sahaptin inhabitants of the Middle Columbia area. In the first place, the material culture as found in the pits most resembles that from historic Sahaptin sites. Historic Salish culture manifestations seem widely divergent. Secondly, there is good evidence that the cremation pits were associated with exposure of the dead. Sahaptins of the area exposed their dead in early historic times and no doubt before, there being indications that their change to burial was recent. Thus they are much more likely to have been responsible for the cremation pits than the Salish, among whom exposure was not practiced or was in British Columbia, a late practice. Thirdly, in recent Wallulapum group-type secondary burials fires were built in the pits before the bones were thrown in—possibly a survival from earlier pit-type group cremation. Lastly, the Salish traditions of being the original inhabitants of the Middle Columbia area are subject to considerable doubt. If an early Salish people did precede the Sahaptins (as seems doubtful), they must have disappeared almost completely by early historic times, and their culture must have resembled that of the Sahaptins and Chinook much more than it did the culture of Salish tribes to the north. There is little evidence, so far, of a prehistoric Salish culture in the area.

Traits common to historic Sahaptins and the cremation culture include exposure of the dead in sheds, mat wrapping of the remains (or coffin), a propensity for red pigment in graves, numerous stemmed arrowpoints, leaf-shaped double-pointed blades, polished bone points, similarly shaped and marked hand game bones, soft string-twined basketry with a twisted two-ply warp, and probably two-piece trumpet-shaped pipes. The presence of such coast traits as plank houses among the Nez Percé and Palouse and canoe burials among the Wallulapum and Yakima would seem to indicate exceptional receptiveness to Chinookan influences or else long residence in the area. The fact that the Sahaptins have no traditions of migration adds to the probability of their being long-time inhabitants of the general area, at least. It may also be significant that the cremation complex coincides in large measure with the historic distribution of Sahaptin tribes. Cremation pits are mentioned in southern Oregon in Modoc territory (Cressman, 1942, p. 130, Fig. 70), but they probably were associated with individual cremation rather than group cremation of the Middle Columbia type. Trade beads were found in the Modoc pits.

The Sundale case is particularly revealing in that there was a combining of the old cremation complex with recent box burial, which apparently entered the Sahaptin area from the east at the time of Lewis and Clark or earlier. In 1840 the Sundale area was definitely Sahaptin territory, a fact that greatly increases the probability that the cremation complex is Sahaptin in origin.

At Wahluke and Sundale we seem to have a joining of two burial complexes, for pit-type group cremations and cist-type individual cremations were found at the same site. If we can postulate an association of group cremation with a Sahaptin people and the cist-type cremation with the Salish, the situation is explainable. The Wahluke area was an unusually good fishing place, and the two ethnic groups may well have co-occupied the site just as Sahaptin, Salish, and Chinookan peoples co-occupied The Dalles. It may well have been because of their contact with the cremating Sahaptins that the Salish applied the cremation technique to their individual cist burials, frequently with not too great success, the bodies being only partially burned.

More proof is needed, but I suspect that we may have found an example of culture change at the Sheep Island site. I doubt that the cremation pits at Sheep Island represent the arrival of a new population and culture. It is much more likely the modification of the old. The early funerary custom was burial in a flexed position on the back as a rule, with the head to the west or south. Burial goods, except with certain favored individuals, were meager. The only ornaments noted were the rectangular shell lip pendants. An influx of new traits brought radical changes in burial practices. The common mode came to be exposure of the dead probably in sheds, red pigment became an important burial concomitant, and there was burning of the sheds, etc.,

after a certain period. Actual changes in the material culture were few. Exposure itself may have had a Plains origin, for the custom seems not to have been at all ancient in the Pacific Northwest, it being of comparatively recent adoption even on the coast. In the Plains the custom is considerably older, occurring in the immediate post-Woodland period—about 1200 A.D.

If we are correct in our inferences that the people responsible for the burials at Sheep Island were later responsible for the cremations, which in turn can be correlated with historic Sahaptin culture, we have the rudiments of an interesting theoretical problem. We can postulate a succession of radical changes in burial customs among Sahaptin peoples of the Middle Columbia—i.e., from flexed primary burial to exposure of the dead (coupled with cremation), then to extended primary burial—in a period of probably less than 200 years. Our evidence seems to corroborate Kroeber's thesis as to the instability of burial customs among primitive peoples (Kroeber, 1927).

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# FACTS AND COMMENTS

## REPLY TO "MIDDLE TRES ZAPOTES AND THE PRE-CLASSIC CERAMIC SEQUENCE"

Drucker's (1952) critical remarks on my work at Tres Zapotes and my interpretation of the first season's excavations at this site call for a reply. Ford (1952), replying to a critical review by Bennyhoff, mentions "the trend that has been developing in archaeology for the free exchange of information and ideas before publication," but there has been no correspondence whatsoever between Drucker and myself, nor was I granted the courtesy of seeing a copy of the manuscript in question in advance of publication.

At the very outset, it must be acknowledged that although Drucker, as he says, was a tyro in Mesoamerican archaeology, he nevertheless went to Tres Zapotes as an experienced archaeologist. I, on the other hand, though well acquainted with the Mesoamerican field, went as a tyro in the art of excavation. In fact, I acted only as an assistant, carrying out daily instructions. Thus there can be no question of the superiority of Drucker's field experience with archaeological techniques over mine.

Now when fresh data are brought to bear on a research problem, it naturally behooves previous investigators to accept the new data and any re-interpretation which such data may demand. Recognizing the limitations of my own methods, I regard it as most fortunate that an archaeologist of Drucker's proficiency was able to begin where I left off, and I am quite prepared for a re-assessment of the situation in the light of his work.

However, when Drucker, despite his assertion that he does not mean to be unfair, creates the impression that just about everything I did in the field was wrong, and that my interpretations are either dubious or one-hundred per cent erroneous, I am compelled to object. He seizes upon and magnifies every difference in our two reports, but fails to point out that the over-all conclusions reached by both of us are virtually identical. (Both of us set the beginnings of Tres Zapotes ceramics as roughly contemporaneous with early Uaxactun and early Monte Alban, and both of us surmised the close of the period of occupation to have occurred prior to the development of Aztec culture.) The wonder is not that two men using such different approaches should come up with differences, but that they should reach such a high measure of agreement. Indeed, as I shall show, Drucker imagines differences between us which do not in fact exist.

There is indeed a difference in our classification of wares. On this point Drucker has been sharply critical, implying that my classification is needlessly refined and archaeologically meaningless. My criteria of a "ware" were derived from Carl Guthe's definition (in his introduction to March, 1934): "A ware is a ceramic group in which all attributes of the paste and the surface finish remain constant." My chief concern was to set forth descriptions which would be sufficiently precise and objective to make it impossible for subsequent students to mistake my meaning. Although the emphasis was on color, I did not permit this criterion to create an endless series of "wares," nor to obscure the essential technological unity of certain groups for which rigid color distinctions would have been meaningless. Thus the fine-textured cream, buff, orange, salmon, and rose-colored specimens of the Upper phase were treated collectively under the term "Yellow and Pink Wares."

Drucker attempted a simplified classification. For his purposes a ware "may be defined as a ceramic group in which these three criteria (slip, vessel shape, and paste) occur most frequently associated" (Drucker, 1943). This definition is closer to what Guthe calls a "type." Drucker himself refers to the resultant groupings as "technological classes of pottery." Such classes are, of course, more comprehensive and possibly more significant than my "wares." However, their presentation in the absence of a more refined classification, does not, in my opinion, make for clarity in Drucker's report. One cannot readily visualize the material, as one can, for instance, in reading Caso's report of his fifth season at Monte Alban (Caso, 1938), wherein each *tipo* is neatly enumerated on the basis of color: *gris, crema, amarillo,* etc. This circumstance, combined with the fact that Drucker made no attempt to correlate his terminology with mine, is, I am certain, partly responsible for the confusion existing with respect to the ceramics of Tres Zapotes. Several people with whom I discussed the matter during the period of the Round Table at Jalapa last summer were of this opinion.

The awkwardness of so comprehensive a classification becomes apparent, when we consider Drucker's Black ware. The vessel shapes in this ware are the same as for his Brown ware. The paste is defined as being "of medium coarseness, containing a good deal of white sand" (Drucker, 1943), but in a certain proportion of specimens it is "as finely divided as that of Polychrome." The color may be black, dark brown, gray, "mottled with irregularly fired cloudlike patches," or olive brown. There may even be a white slip. It would doubtless be carrying the argument too far to suggest that we might conceivably have a white vessel with the shape of a Brown one and the paste of a Polychrome which we would nevertheless call Black, but the suggestion illustrates the difficulties involved. (Incidentally, with reference to the Polychrome, we are told categorically that "the significant characteristic of the group is that composite silhouettes definitely never occur." Yet among the illustrations of this ware—Pl. 11, *c, d, k*; Pl. 16, *h*—are examples which cannot be designated as simple silhouettes.)

It is worthy of note that Drucker makes no place in his scheme for Gray ware in its own right. He suggests that my Polished Gray may be Black ware which has lost its color. This I doubt. A surface finish of such beauty must surely have been a result specifically desired by the maker. The ware closely resembles the polished

gray ware of early Monte Alban. That Drucker does not recognize it is not strange. It showed up in only one or two of the 1939 excavations which produced what I have called Middle A material, none of which was abundant. It does surprise me that the run-of-the-mill gray ware, sherds of which made up 12.8% of my Ranchito collection, receives no special treatment. I saw thousands of these sherds, many of them of considerable size. In no instance did I see any evidence that they had ever possessed a black slip.

I do not mean to imply that I fail to see the logic and the merit of Drucker's approach to pottery classification. Nevertheless, I cannot help wondering how successfully it can be carried out in the absence of on-the-spot studies of local clays and their behavior under varying conditions of firing, as urged by Matson (1951).

We come now to the matter of whether or not it is justifiable to divide Middle Tres Zapotes into subphases A and B, an issue which looms large in Drucker's critique. Here I feel that our controversy hinges more on terminological practice than on interpretation of the data. The material which led me to postulate the existence of Middle A (older than Middle B) was, if I remember correctly, a segregated collection of sherds and figurines taken from the bottom of a trench cut through mound G (the Stone Platform) in the Arroyo mound group. This level would have been well below the surface of the Arroyo flood plain. What especially impressed me about this collection was first, the general crudeness of most of these sherds as compared with those hitherto found; second, the extraordinary lustre of the Polished Red and the fine finish of the Polished Gray. Moreover, the Red-and-White incised ware was unique. None of these three wares had appeared in the Ranchito excavations. Moreover, not only was the total range of wares much smaller than in the Ranchito material, but there were none of the proto-Classic features (Mayoid sherds, Xipe heads, yoke fragments, etc.) which I have associated with Middle B.

Drucker is most emphatic in denying that there is any cultural break in the Middle Tres Zapotes continuum. In making the subdivision into A and B it was never my intention to imply such a break. Several of my Middle A wares (Smothered, Porous White, Unpolished Gray) I have listed as continuing through Middle B. I surmised that Middle B Speckled ware is the direct descendant of Middle A Striated. A similar relationship may exist between other Middle B and Middle A wares. In other words, I regard Middle A as simply an early manifestation of the total Middle phase. There would seem to be good precedent for singling it out. The chronology of Monte Alban is split into five periods; yet only between Periods IV and V is a definite cultural break recognized. The other divisions serve only to call attention to successive innovations, borrowings, and stages in the internal development of Zapotecan culture. It is in this sense that I proposed the division. Perhaps in this connection it is I who have never made myself clear. I therefore go on record as saying that I agree fully with Drucker in declaring the Middle Tres Zapotes phase to have been an unbroken continuum.

There remain, however, unresolved discrepancies as to how much should be included in this continuum. "Weiant's 'Middle A' and 'Middle B' combined," writes Drucker, "were supposed to be the equivalent of my single 'Middle' phase, although actually they are not" (Drucker, 1952). If they are not, I should like to ask him what he would do with my Middle A material. I presume, however, that what he had in mind in saying this was that I have included proto-Classic elements, all of which he assigns to the Upper phase. On this point I cannot yield. He asserts that my stratigraphic inferences are based on collections which came principally from cuts into mound-fill. This is not the case. Middle A material came not from mound-fill, but from a depth well below the base of a mound. Middle B material came from the zone of the deep burials (not in a mound) and from an excavated extension of this zone across the top of the East Promontory, almost up to, but not including a mound, as my map shows (Weiant, 1943, p. 8), while the material which defined the Upper phase came from the surface burials above the deep ones, situated well outside the boundaries of any mound.

On the basis of his stratigraphic evidence Drucker maintains that proto-Classic elements never reached the Middle Tres Zapotes phase. In this connection I wish to quote from Stirling's field notes; all quotations refer to the broad trench which formed an extension of the Zone of the Burials into the East Promontory. Under date of Feb. 8, 1939 I find this: "At a depth of 6 feet a piece of a well carved stone yoke was recovered. . . . This morning in almost the same place we found a rim sherd of fine chocolate brown sculptured Mayan pottery, with a human head, flowing plumes, etc., sculptured in relief." Under date of Feb. 11 I find: "At the same depth and within 2 feet of the same spot found another sherd of sculptured ware. This was yellow ware and the design showed a vertical serpent almost exactly like the ones shown in the Dresden Codex. At the west end of the long mound *in the main trench* (italics mine) found two more sherds . . . of sculptured ware similar to the first found. They were also chocolate brown ware. Near this same place a small Xipe head was found showing a face wearing the slit skin from the face of a flayed person." There are references also to "a plaque on which is the very finely modeled face of a dead man or sleeping man with large round ear spools," and to "several broken seals, one cylindrical," as well as other Classic or proto-Classic elements. It is difficult to explain away this evidence. In the face of it I do not see how I can be criticized for reaching the obvious and unavoidable conclusions which I did.

Certainly the most important difference between our two reports concerns the allegedly intrusive character of the surface burials, the material which Drucker calls the Soncautla complex. Drucker has adduced persuasive

evidence on this point, and I acknowledge that this may have been a serious slip on my part. I have never been able to understand, however, his choice of this name for the complex. A careful study of Strebel's plates (Strebel, 1885-89) reveals very few points of resemblance with the finds in question. There are pitchers, but a comparison with those of the Mixtec area would be equally valid. The shoe form, because of its enormous distribution in time and space, is a most unsuitable criterion, and as far as I can judge from Drucker's report he found but one specimen. There is a certain rather generalized type of olla with high neck and three lugs which occurs at both places, although the single photograph in Strebel is incomplete, and finally there is a not too distinctive olla bowl which looks similar. As for loop legs and strap handles, I have not ascertained whether Strebel refers to these in his texts; they are not shown in the plates. On the other hand, the potstand, the bowl with ring base, and the vessel with hobnail decoration (Pl. XXI) have no parallel at Tres Zapotes. Nor do we find zoomorphic supports at Tres Zapotes, as at Soncautla. Most important of all, the presence of metal, in the form of a copper ring bearing a mask, would appear to place the Soncautla material as chronologically later than anything at Tres Zapotes. As for cremated burials, Strebel states (p. 93) that both cremated and uncremated burials were found in the grave-mounds of Soncautla, with no difference in the associated ceramics. And this brings to mind a problem ignored by Drucker. In mound C of the Ranchito group, at a depth of 9 feet, we encountered in 1939 a direct burial over the middle of which was a Red ware olla having as a cover an inverted tripod loop-legged bowl like those which covered surface burials.

Is it not strange, too, that a group of people should have arrived, as Drucker postulates, one or two centuries after Tres Zapotes had been abandoned, and that almost the only trace which they left is one small cemetery situated at the exact spot where the earlier population had buried their dead? What a coincidence!

Drucker has raised no issue with respect to the figurines, but I feel that, in the effort to dispel confusion, it should be pointed out that his type C is actually Vaillant's type A. Since the latter terminology has come to be used very generally in the literature, it would be unfortunate to attempt a change. While my scheme for the development of types rests primarily on typology, his is based upon stratigraphy and should therefore be the more reliable. Yet when it is remembered that the actual number of specimens which he obtained from a given level was quite small—often only one or two—one can hardly help wondering how much reliance can be placed on his particular scheme.

I do not wish to close my discussion without a word of comment on one sentence of Drucker's report: "Our respective views as to relationships with other Middle American regions, based on typological similarities, are not very close, but these are matters of opinion, and depend in the last analysis on the degree of likeness that one demands for a 'similarity.'" He gives no specific instances, but in reply let me say that I have yet to hear any serious criticisms on this score from other workers in the Middle American field. In a review of both reports Ekholm (1945) recommended mine for "more extensive comparisons with other areas" (and incidentally criticized Drucker's broad ceramic groupings). Valenzuela (fresh from Monte Alban) confirmed my comparisons of Tres Zapotes sherds with those from that site. Caso verified my identification of the glyph on a stone yoke as the Zapotecan Glyph C, and so on.

In conclusion, I accept Ekholm's verdict; namely, that "Drucker's report is based on the more comprehensive body of evidence and gives us the more accurate and detailed outline of Tres Zapotes history," but I herewith register my objection to being accused of errors which I did not make.

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## ROBINSON'S COEFFICIENT OF AGREEMENT — A REJOINDER

In a recent issue of this journal (Vol. 17, p. 151) Donald J. Lehmer protests against the coefficient of agreement used by W. S. Robinson in his paper on "A Method for Chronologically Ordering Archaeological Deposits" (*American Antiquity*, Vol. 16, pp. 293-301). Lehmer's objection to the coefficient

> . . . lies in the fact that it takes no account of differences in the size of the collections. Every sherd collection must be regarded as a sample representing a universe which is made up of *all* of the sherds in that particular level, site, or whatever. The larger the sample, the more likely it is to give an accurate indication of the true proportions of the various sherd types in the universe from which it was drawn. The smaller the sample, the more likely it is to deviate from those true proportions. Any acceptable measure of the similarity between two such samples must inherently take this into account by allowing for a greater difference between samples from similar universes when those samples are small. Otherwise, the small sample and the large sample are accepted as being equally representative of the universes from which they are drawn.

He proposes to substitute for the coefficient of agreement the mean standard error of the differences which make up the coefficient of agreement, or rather the complement of the mean standard error so as to make it a measure of agreement rather than disagreement. The effect of computing the mean standard error is to inflate the observed differences if the collections are large, and to reduce them if the collections are small. In other words, Lehmer's proposed measure will do precisely what he claims it will do: it will give differential importance to the observed differences between any two deposits in terms of the sizes of the two collections involved.

While Lehmer's proposed measure will do what he claims it will do, it will not do what the situation requires. Lehmer has confused two very different statistical problems, *viz.*, the problem of estimating a population parameter and the problem of testing the statistical significance of an observed result (*cf.* R. A. Fisher, *Statistical Methods for Research Workers*, Edinburgh, 1938, Section 2).

The coefficient of agreement is based upon the differences between pairs of proportions for two deposits. The problem involved is to estimate from the sample differences what the differences would be in the total population of sherds from which the observed collections are presumably samples. Now the sample proportion is a "best" estimate (the unbiased and minimum variance estimate) of the corresponding population proportion *regardless of how many cases there are in the sample*. Therefore in the agreement coefficient the sample proportion was used as an estimate of the population proportion. Moreover, the "best" estimate of the difference between two population proportions is the difference between the corresponding sample proportions *regardless of how many cases there are in the samples*, and therefore this difference was used in the agreement coefficient. To modify this difference by dividing it by a function of the numbers of cases in the two deposits will certainly tell us whether the difference is statistically significant (*i.e.*, too large to be ascribed to chance sampling errors), but it will furnish us with a biased estimate of the population difference. The problem at this point is to get an estimate of a population difference; it is not to test the significance of that difference. Moreover, the method as presented by Robinson does include a test of significance as a final step.

TABLE 2. PERCENTAGES OF FOUR TYPES OF POTTERY IN FOUR DEPOSITS

| | *Deposit* | | | |
|---|---|---|---|---|
| Type | I | II | III | IV |
| A | 90 | 70 | 50 | 40 |
| B | 2 | 5 | 10 | 33 |
| C | 0 | 15 | 29 | 2 |
| D | 8 | 10 | 11 | 25 |
| | 100 | 100 | 100 | 100 |
| (N) | (5000) | (80) | (4000) | (90) |

TABLE 3. ROBINSON'S AGREEMENT COEFFICIENTS

| | I | II | III | IV |
|---|---|---|---|---|
| I | ..... | 160 | 120 | 100 |
| II | 160 | ..... | 160 | 114 |
| III | 120 | 160 | ..... | 126 |
| IV | 100 | 114 | 126 | ..... |

TABLE 4. COMPLEMENTS OF LEHMER'S MEAN STANDARD ERRORS

| | I | II | III | IV |
|---|---|---|---|---|
| I | ..... | 21.1 | 3.9 | 17.8 |
| II | 21.1 | ..... | 28.0 | 26.5 |
| III | 3.9 | 28.0 | ..... | 25.3 |
| IV | 17.8 | 26.5 | 25.3 | ..... |

To satisfy the pragmatic reader, we present a simple hypothetical problem in ordering. Table 2 presents the percentages of four types of pottery (A, B, C, D) in four deposits (I, II, III, IV), with the sample size or number of sherds shown (as N) at the foot of each column. The hypothetical data show clear-cut lenticular frequency changes through time, with the time order of the deposits being either I, II, III, IV or IV, III, II, I. The sample sizes have been made widely different to test the effect of introducing Lehmer's formula. Table 3 presents Robinson's agreement coefficients, computed from the percentages in Table 2, and it is apparent that the agreement coefficients correctly order the deposits. Table 4 shows the complements of Lehmer's mean standard errors computed from the percentages and numbers of cases in Table 2. Each mean standard error was subtracted from 30 to get a measure of agreement rather than disagreement. It is apparent that Lehmer's measures do not correctly order

the deposits. In fact, the experimentally minded reader will discover that there are 24 possible orders for the four deposits (but only 12 unique ones), and that in not one of those 24 possible orders does Lehmer's measure give the desired internal arrangement of coefficients discussed in Robinson's article.

In concluding we join Ford (*American Antiquity*, Vol. 17, p. 250, 1952) in his recent objection to the publishing of critiques which do not evidence a conscientious attempt at private clarification and agreement among the parties concerned. Our first knowledge of Lehmer's critique was its appearance in print, and we regret that this fact has forced us to expound in an archaeological journal upon matters which ought to be relegated to a course in elementary statistics.

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## CLAY EAR SPOOLS FROM THE AZTALAN SITE, WISCONSIN

In the months of July and August, 1950, excavation at the Aztalan Village site was carried on by the Wisconsin Archaeological Survey under the field supervision of Chandler W. Rowe. Additional information was gathered concerning this Middle Mississippi village; this information is being prepared for publication. However, it seems advisable to record the peculiar situation encountered in three of the refuse pits (features 76, 74 and 83) in the hope that correlative information may be forthcoming.

A total of 98 pits have been excavated by the survey in the last two seasons at Aztalan. Whatever their original function, it is apparent that these pits now contain the refuse swept from house floors and habitation areas—sherds, animal refuse, small pieces of charcoal and occasional artifacts. Except in the cases to be noted below, we have no indication that fires were built in these pits. Although the pits range in size from 2 to 7 feet in diameter, the majority average 3 feet in diameter and 3 feet in surface depth. Until the excavation of feature 76, none of the pits had exceeded 4 feet in surface depth.

When the excavation of feature 76 was begun it was apparent that this pit, 4 feet in diameter, had been filled with refuse from habitation areas. However, at a surface depth of 2½ feet a quantity of charcoal, charred grass, and charred logs was encountered. From this level to the floor of the pit at a surface depth of 7.2 feet, the contents of the pit were primarily pure wood ash—indicating that complete combustion of wood or grass had taken place within the pit. Occasional thin layers of waterlaid silt and compacted masses of silt, charcoal, ash and fish bones, indicated that the pit had probably been covered much of the time, but that water and silt had seeped in intermittently. The sand walls of the pit had been fire blackened, and in some places the sand had fallen in on the smoldering fire.

The 5 foot thick ash layer in the pit was unusually rich in cultural material. There was a total of 547 potsherds, primarily concentrated in the bottom 3 feet of the pit. Of these sherds, 77 were rim fragments, almost equally divided between Mississippian and Woodland types, as is customary in all of the pits in the Aztalan site. The food refuse differed slightly in quality from that of the typical Aztalan refuse pit. There were none of the joints of larger mammals and

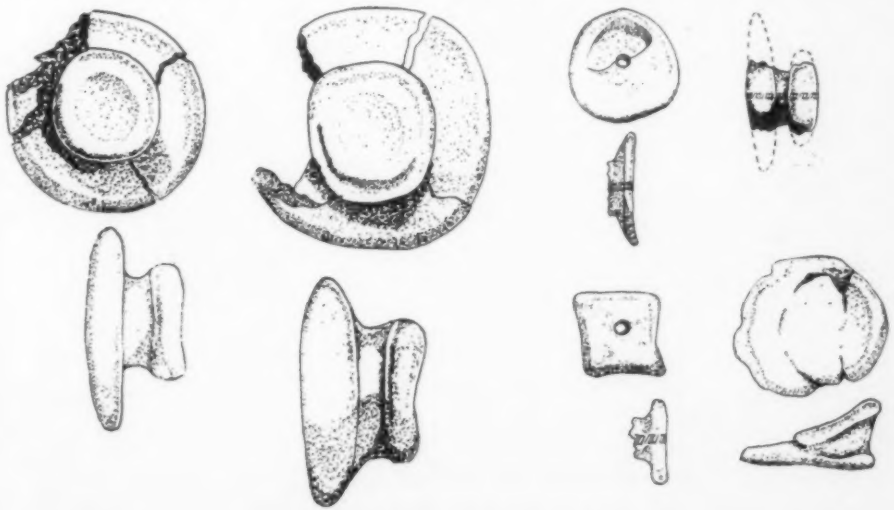

Fig. 42. Clay ear spools from Aztalan.

very few mussel shells, but there was a quantity of deer vertebrae, bones of smaller mammals and rodents and many more remains of birds, fish and turtle than is customary. Four charred kernels of corn were also found in the ash—the only remains of corn that have been found in the site.

At a surface depth of 5.2 feet an articulated right human arm (probably female) was found. The distal ends of both radius and ulna had been broken and slightly charred. Although the presence of human bones in the midst of food animal refuse is by no means unusual at the site, the human arm in feature 76 seems out of place among the remains of so many smaller animals.

In addition to the pottery and food refuse there were 3 projectile points, 2 bone awls (perforated deer scapulae), 1 antler flaker, 4 shell disc beads, 3 small strips of copper, 1 rolled copper bead and more than 15 clay ear spools. It is the presence of the ear spools that has prompted this comment. Our experience at the site had led us to treat the ear spool as a rare trait in the culture complex; therefore the concentration of 15 in one pit seemed highly significant.

During the somewhat lengthy excavation of feature 76 a number of pits were being excavated by other members of the crew. Of these pits it was found that feature 74, 6 feet away and feature 83, 26 feet away, provided close parallels to feature 76. Feature 74 was circular, 3 feet in diameter, 5.6 feet deep and filled with wood ash and small pieces of charcoal. It contained 186 sherds (46 rim fragments), very few animal bones, many fish bones, 1 projectile point and more than 3 clay ear spools. The mortality of ear spools was probably high in the excavation of this pit. The ash and silt was so compact that it was impossible to excavate much of it with a trowel, and since the ear spools were considerably softer than their matrix, only three could be recovered and this with extreme difficulty.

Feature 83 was also circular, 3.2 feet in diameter, and was 4.5 feet deep. Again a hot fire had been kept burning within the pit for some time and the ashes were rich in cultural material. One hundred and ninety-six sherds were found (32 rim fragments), very few animal bones, 2 projectile points, 3 deer toe "tinklers," 6 bone awls, a worked deer tooth, a barrel-shaped pottery bead and more than 7 clay ear spools.

At this stage of the analysis it is impossible to determine the contemporaneity or the relative age of these 3 pits. Feature 83 is so close to the vestibule wall of house 3 that it hardly seems probable that bonfires could have been built in the pit while the structure was still standing. However, since house 3 had been burned, our reasoning may be rather specious here. Both feature 76 and feature 74 are more recent than a small stockade which appears as a narrow wall trench (Fig. 43), but at this time it is not possible to determine how much younger they are.

The ear spools themselves are very crude. Of the 25 recovered, only 9 could be restored. The remainder were small fragments, or so soft that they could be observed but not removed whole from the hard matrix of the pit. All of the 9 had been molded from a fine-grained clay, and except for Figure 42, *f*, which was tempered with sand, they were untempered. The manner in which they tended to disintegrate on exposure suggests that they might have been only sun-dried and then thrown into the ashes after the fire had cooled. Four of the 9 were perforated, molded around grass stems, but the perforations are much smaller than those in the carefully ground and polished

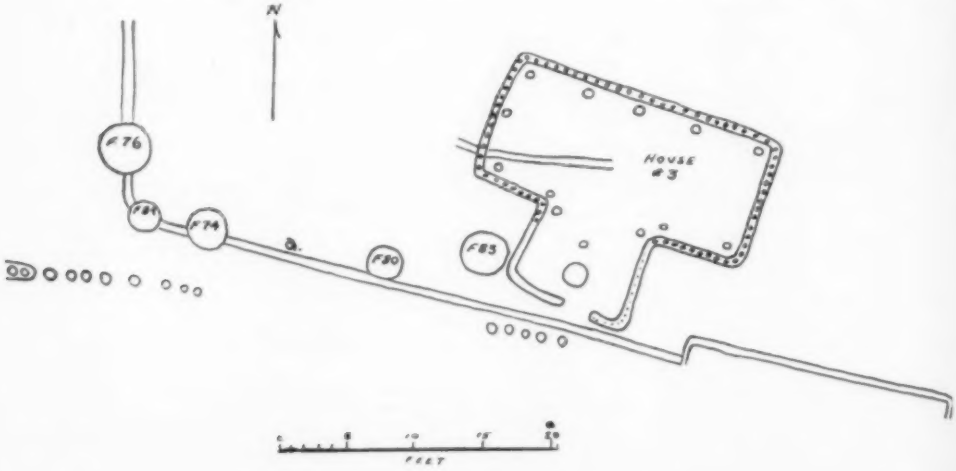


FIG. 43. Ground plan of portion of Aztalan site.

stone and bone ear spools found elsewhere in the site. One of the spools, Figure 42, *f*, had apparently been stepped on while it was still damp.

These are not the only clay ear spools to have been found in the Aztalan site. Of the total of 20 ear spools found in Barrett's excavation of the site (Barrett, S. A. Ancient Aztalan, *Bulletin of the Public Museum of the City of Milwaukee*, Vol. 13, 1933), 7 are of clay, or "pottery." Unfortunately provenience data is not available for most of these. At least one was found in the refuse area outside of the eastern wall of the outer stockade. However, significantly enough, at least 3 of the remaining six were found in one pit (Section V, No. 81) which Barrett calls "rather remarkable." Features of this pit which he considers to be unusual are the 6 foot surface depth of the pit 3 feet in diameter; the unusual richness of the pit, especially in terms of fragments of copper, and the fact that the pit contained a quantity of ash and charcoal. In addition to this evidence, Barrett found at least 2 artifacts which he refers to as "tiny pottery smoothers" and which bear a close resemblance to our Figure 42, *a, b*, from feature 76. Although the provenience data for the "tiny pot smoothers" is lacking, the sequence of catalogue numbers suggests that they also might have been found in or near Barrett's pit 81. Even discounting the evidence from these 2 artifacts, it seems highly significant that of the total of 33 clay ear spools reported from the collections made by Barrett, Jaycox and the Wisconsin Archaeological Survey, 28 come from only 4 pits, and that these 4 pits differ from the total of approximately 160 pits excavated on the site in the same specific respects.

Therefore it seems possible that we are dealing here with the remnant of some religious ceremony. In a reconstruction of the sequence of events it would appear that first a large, hot fire, of dried bark, grass and small branches, was allowed to burn in the bottom of a deep pit for a period of several days. During this period fragments of pottery, fish and bird skeletons, and corn kernels were thrown into the fire, either as refuse or as offerings. After the fire had cooled, crude clay ear spools, made solely for this purpose, were thrown into the ashes. The pit was then covered, although with heavy rains, silt was washed under the edges of the cover and down into the pit. Subsequent fires were built in the pit, and again sherds, fish and bird bones thrown in. Ear spools, which seem to be concentrated in the bottom two feet of the pits, may have been thrown in only during one ceremony. From time to time the pits may have been used in a purely secular fashion, as general trash receptacles. Certainly this was the final use of the pits. But it would appear possible that they were originally dug and used for some sacred purpose.

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## A PETROGLYPH IN NORTHERN ALASKA

A unique stone bearing a number of rude linear cuts (Fig. 44), some in a design, was found in the course of routine fieldwork during the summer of 1950 by a party of geologists of the U. S. Geological Survey, Navy Oil Unit. This field party, to whom the credit for the discovery belongs, was under the leadership of Charles L. Whittington. Also present at the discovery were John Stevens, Leonard Rolnick, Bruce Thompson and Francis Minard. Although petroglyphs as individual items are not uncommon elsewhere on the continent, its occurrence in northern Alaska is singular enough to be worth recording.

The site of the find is about 90 airline miles inland from Icy Cape on the Arctic Ocean. The petroglyph was found on the side of a prominent landmark, now called in unpublished reports Eskimo Hill, which is situated near the junction of Carbon Creek and the Utukok River near the headwaters of the latter river. The name of the hill was originally Carbon Hill, named by W. T. Foran (Field Notes of W. T. Foran, 1924, filed in the Alaskan and Foreign Section, U. S. Geological Survey, Washington, D. C. Unpublished), a geologist who explored this region in 1924. In the field notes

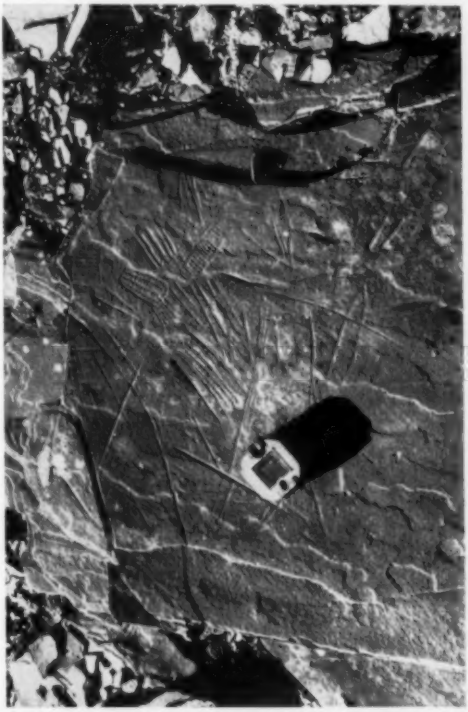

FIG. 44. Petroglyph from northern Alaska (United States Geological Survey photograph).

of Raymond M. Thompson (Field Notes of Raymond M. Thompson, 1947, filed in the Alaskan and Foreign Section, U. S. Geological Survey, Washington, D. C. Unpublished), the same feature is noted as Eskimo Hill. Viewed from the west, this hill appears conical. Viewed toward its longer dimensions from north or south, this eminence is not so extraordinary, since it is part of a long sandstone ridge, trending northwest and southeast. That this hill was recognized as a landmark by the Eskimos we have no authoritative proof in the literature, nor do there seem to be any natives who can tell us anything about it. Yet there is mute evidence on the hill removing all doubt about its occupation. Numerous flakes of chert were found littering the surface around this knob by the geologists. Thompson (Thompson, Raymond M. 1948. Notes on the Archaeology of the Utukok River, Northwestern Alaska. *American Antiquity*, Vol. 17, No. 1, pp. 62-5), who described the first Folsom projectile point found in northern Alaska also records abundant chippings in this locale. He calls this site 14 A in his report.

The petroglyph (Fig. 44) is on a well weathered flat slab of native sandstone about 3 or 4 feet square imbedded rather firmly in the soil. It is lying exposed to the elements on the southeast slope of the hill about 1000 feet from the summit. The stone may have been shifted by solifluction. It is cracked, and some portions have broken away. There are markings and incisions cut on one portion of the slab. Some of the markings appear to be broken off. By far the majority of the incisions appear to have been haphazardly cut on the rock face, suggesting use as a sharpening agent. Indicating less random preoccupation are at least four discernible oblong sets of incisions. Each is smaller than a Brunton compass. The two most prominent figures are cross hatched, producing a kind of corncob effect. What these scratchings are supposed to represent or to what purpose these figures were inscribed on Eskimo Hill we cannot tell. To offer one guess which sounds as plausible as any other, it might be suggested that the marks were made by a hunter whiling away his time on the vantage point, waiting for a sight of game. In short, a kind of doodling. The mechanics of making linear cuts appears to be easiest and simplest on stone. Next in order of difficulty and complexity are the more purposefully designed cross hatchings, enclosed within an oblong as a graduated measure of doodling proficiency. Certainly the latter are more aesthetically pleasing to the eye. The artist or artists might have sat on the one side of the stone slab inscribing the figures during his vigil. Finders of the stone are not certain whether or not flint chippings were associated with it. No part of the petroglyph was brought back.

From the appearance of the wear on the majority of the grooves and the lichens present on the markings, we might safely say that this example of Arctic petroglyphics is not recent. How old it actually is, one cannot say. It seems old enough to be prehistoric. It is the first instance of petroglyphy known to the writer on record for interior Arctic Alaska.

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Washington 25, D. C.
May, 1951

## UNUSUAL FLINT BLADE FROM THE OZARKS

The large flint blade (Fig. 45) was found several years ago by A. C. Smith, who lives on West Sugar Loaf Creek near Lead Hill, Arkansas. He found the specimen near a small shelter entrance on the stream in association with three others of the same size and type. However, the others have been given away and their whereabouts are unknown. Artifacts found in the same general area are all of the stemmed and barbed projectile point variety commonly associated with the Woodland Pattern.

This specimen exhibits carefully executed flaking, and the base has been carefully smoothed by grinding. This edge grinding extends around the base and up the sides for a distance of 2.5 cm. Over-all length of the point is 16.5 cm., width is 4.75 cm. and the thickness

FIG. 45.

through the midsection is .5 cm. The base has been carefully thinned, but there is no fluting. Color of the specimen is a cream-white.

Although smaller specimens of this general type have been found occasionally in the Ozarks region, none of this great size have been noted. Carl H. Chapman, director of American archaeology at the University of Missouri, and Lynn Howard, assistant curator of the University of Arkansas Museum, both say this is the first specimen of this large a size and type they have examined. Alex D. Krieger, of the University of Texas, following an examination of a photograph of this artifact, says that the "specimen is difficult to classify. It could, of course, be called 'Folsom-like,' but I think this is a meaningless term. It is far too large for a Folsom point, and besides it does not seem to be fluted. It is also much too large for Plainview points, as we know them. It is, in fact, a rather unusual specimen in its great size, combined with the gentle taper, concave base, basal 'ears' and edge grinding. This combination leads me to think it may be closely related to the large fluted points found in several cases with Pleistocene elephants, but we have no known type of unfluted points that it would fit into now."

Reports of similar points of this size and type would be welcomed.

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September, 1951

## THE MANGUM PLATE

The Mangum Plate consists of three fragments of elaborately embossed copper sheeting formed of separate parts overlapped and hammered together and riveted where necessary. The pieces were found in 1936 by Spurgeon C. Mangum on a knoll situated on his farm 5 miles northeast of Port Gibson, Mississippi, 1 mile south of Bayou Pierre (R 3E, Tn 12N, S 28). The site has since been acquired by the State of Mississippi for the National Park Service for development as a feature of archaeological interest along the Natchez Trace Parkway.

The poor condition of what was probably a single plate of several jointed units is accounted for by the circumstances of discovery. Quantities of human bone lying immediately below the surface caused Mr. Mangum to halt plowing on the knoll and begin a series of tests and random excavations in the area. One such test, done with a post hole digger, located pieces of copper 50 feet southeast of the apex of the knoll at a depth of 4.5 feet. Digging at the spot uncovered a human adult burial extended on the back, head east, with the damaged copper pieces subsequently known as the Mangum Plate, on the chest. Mr. Mangum recalls the pieces as having appeared to be connected so that the whole had a width of about 12 inches. Next to this body, according to the finder, was a second adult, likewise extended on the back, head east, with evidence of an unborn child in the pelvic region.

Later, Mr. Mangum uncovered a group of burials about 20 feet northwest of the apex of the knoll. Eleven skeletons in all were ranged in a circle, heads to the center, bodies radiating outward like spokes of a wheel, according to the finder. Some disc-like stones were recovered with these burials, perhaps half a dozen in number, as well as some perfect discs, probably chunky stones, one of which, a white sandstone 3 inches in diameter and 1 inch thick, was saved and turned over to the writer.

Two other burials were also tested, according to Mr. Mangum. One, an adult, was located east of the top of the knoll and is described as having had a pair of disc-like stones ("like checkers") with it, one on either side of the jaw. The stones were not retained by Mr. Mangum. The other burial, an adult, had a small plain pot with it, the only vessel now preserved from the site, of a type familiar in the Plaquemine and Natchez horizons. Several pots were reported taken from burials subsequently at various times, but all are now lost.

### The 1951 Tests

The only excavation by the Natchez Trace Parkway Survey was a series of 4 limited tests in April, 1951. At this time the approximate location and extent of the burial area was determined as an oval area about 50 by 100 feet along the crest of the knoll. Two tests made 100 feet northeast of the apex, well down the slope, were culturally negative. A third test made 40 feet northwest of the crest likewise contained no cultural evidence. A fourth test made 100 feet southeast of the crest began as a 5 by 10 foot trench which was enlarged to 230 square feet to uncover 13 individuals, all but one of which lay extended, on the back, with head to the east. These burials could not be excavated completely, but sufficient work was done to determine that at least two had been disturbed by plowing or previous excavation. There is a possibility that one is a bundle burial.

The field report and copper plate fragments were sent to Mrs. Virginia Watson whose studies of copper plates associated with the Southeastern Ceremonial Cult well qualified her to comment on the new material. The following observations are provided with Mrs. Watson's cooperation.

Individual weights in grams for the three pieces are: 26.4, 21.0 and 5.6, making a total for the surviving fragments of 53 grams.

The basic plate on which the design was embossed is composed of two more or less equally thick layers of copper hammered together. There are 7 places on the three fragments of the Mangum Plate where riveting of one piece of copper to another has occurred (Fig. 46). The purpose of riveting was neither to enlarge the basic plate nor to repair a break, but rather to strengthen places of weakness, notably the tips of

the wing feathers. The riveting was done before the design was embossed on the copper plate. (This is notably at variance with the Wulfing Plates on which a piece was added after the design was made, with an attempt to match the original design.)

In comparing the Mangum specimens with other repoussé copper plates, Mrs. Watson notes that the Mangum Plate differs considerably from the Wulfing and Spiro plates in that a complete human figure plus wing elements is presented, not merely a winged being or winged being with human head or mask. Thus the Mangum Plate has greater similarity to 4 copper plates found at Etowah.

The central theme in the Mangum Plate design is a human figure in ceremonial garb. The face has indications of the forked eye with pupil and circum-ocular marking, an ear spool and two beads in front of the latter. The upturned face is unusual. A photograph taken of the Mangum Plate fragments in 1941 by Albert C. Spaulding, who originally recorded the site, shows there were originally antler-like projections of copper above the face. These projections are now missing, as is a fourth fragment, the smallest, on which the embossing is not observable. A series of projections on the upper part of the headdress may indicate feathers (possibly a roach), and below this six circular holes in the copper form part of the headdress design. Four beads of a necklace are discernible in the damaged neck portion, and a collar is indicated by concentric lines below the beads.

One of the arm position variants in Southeastern Ceremonial Cult representations of humans in vestments is shown in the bent elbows with hands raised to head level, and wrists each adorned with a beaded bracelet, indicated by four rows of small embossed dots varying in each row from three to five. Unpublished designs from Spiro shell engravings show an arm position which closely corresponds to that on the Mangum Plate. Bent arm representations appear on one or two of the Etowah plates, but not in just this upward position.

Details of costume indicate some unfamiliar design elements, but others which suggest affinity with designs on shell gorgets from Spiro are worth noting. Despite the fragmentary aspect of the Mangum Plate figuration, traces of a beaded belt and fringed apron remain in the mid-torso area. Above the belt two groups of interlocking scallops and a tassel with pendent feather appear.

At either side of the human figure, wing feathers are conventionally represented by two vertical rows of elongated semicircles, with an embossed line lateral to each row. This embossed line appears to distinguish the Mangum Plate from the Wulfing, Spiro and Etowah

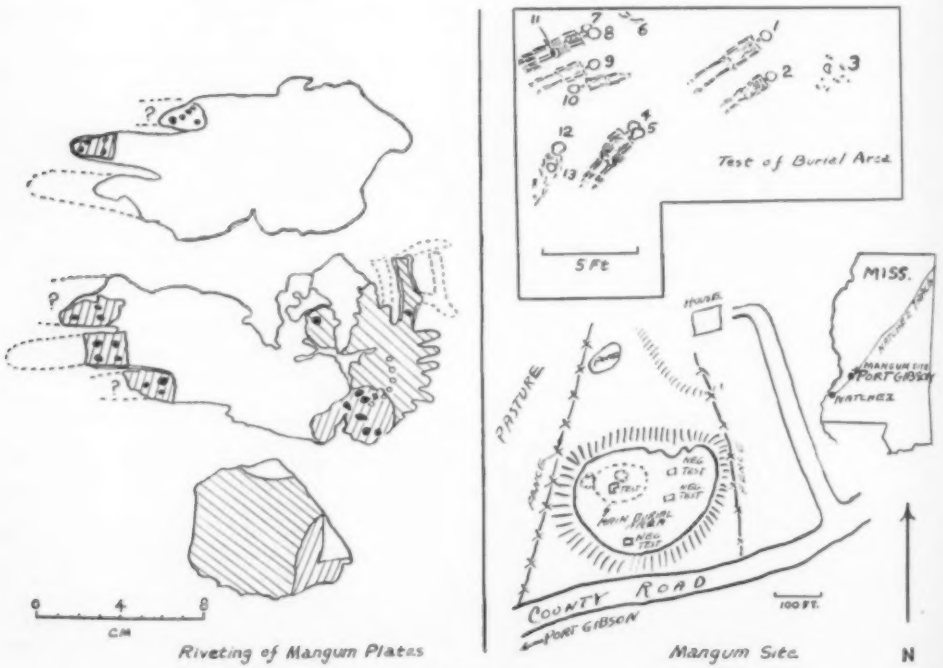



FIG. 46.

plates. The wing feathers terminate the bottom of the plate in six projections which were once considerably longer.

Mrs. Watson suggests that the third and smallest fragment of the Mangum Plate with two series of three curved parallel embossed lines may comprise conventionalized tail feathers similar to treatment found on Wulfing, Spiro and Etowah plates.

Through arrangements made by Mrs. Watson, qualitative spectrographic analyses of samples of the three Mangum Plate fragments were made at the Department of Geology and Geological Engineering, Washington University, St. Louis. The report submitted by Joseph E. Cox, Jr., who conducted the tests, may be summarized as follows:

Solid specimens of the three Mangum Plate fragments were excited in the arc of an ARL 1.5 meter grating spectroscope with DC arc rectifier. (Solid specimens were found preferable to those dissolved in acid and the salts and residue excited.) Comparison samples of solid native copper from each of the following 12 mining districts were excited under the same conditions: Keweenaw Point, Michigan; Calumet, Michigan; Hancock, Michigan; Michigan (unspecified); Stanton, Missouri; Metahambra Mine, Cuba; Chihuahua, Mexico; Grant County, N. M.; Clifton, Arizona; Bisbee, Arizona; Red Cloud Mine, Yuma County, Arizona; Montrose County, Colorado. Results showed: (1) The three samples from the Mangum Plate fragments are of similar composition in major and trace elements; (2) in the analyses of native copper ores from 12 mining districts, samples from Keweenaw Point, Michigan and Clifton, Arizona have compositions corresponding to that of the plate material.

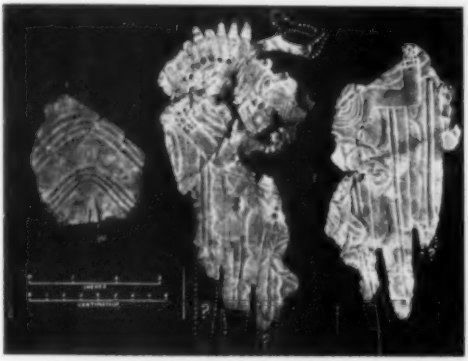
Although the ore samples from all 12 localities tested were native copper (with small amounts of gangue material), the Michigan deposits are the only ones in which the native copper predominates as the major copper bearing mineral, native copper not being abundant in the other districts. Evidence strongly implies Michigan sources for the Mangum copper.

In summary, the Mangum Site represents a small burial ground on a natural knoll overlooking the Bayou Pierre bottoms. The burials were laid down in profusion, the deepest ones definitely in the flesh, the more superficial ones too disturbed by cultivation and amateur excavation to render observation reliable. Burial was characteristically in pairs, one body directly matched in position above the other, and usually male and female.

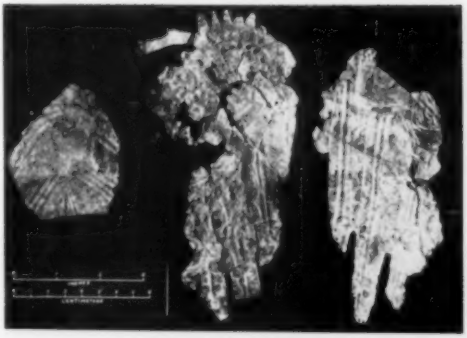
Cultural evidence aside from the copper plate fragments is scanty, but a Plaquemine horizon is indicated by the form of the clay grit plain pot known to have come from the site. This pot, now donated to Natchez Trace Parkway by Mangum, is remarkably similar to forms observed at the Anna site 50 miles to the south, a known Plaquemine and Natchez horizon site. Another Plaquemine trait is represented by the "Alba Barbed" arrowhead observed in association with burial 4. This type point was found at the Gordon site, a Plaquemine horizon mound and village group some 35 miles south on Coles Creek. The skeletal material was in excellent preservation when not disturbed, and the skulls were not filled with earth, giving inferential evidence that the site is recent. One intact female skull, that of burial 5, was preserved and submitted to the United States National Museum where it was studied, together with the male skeleton for burial 4. The burial 5 skull, according to Marshall T. Newman, represents a Centralid (Gulf) type, is undeformed, and has a length-breadth index of 82.1. The burial 4 male has a reconstructed stature of 166.4 cm. (5 ft. 5½ in.), slightly under the expected average for southeastern Indians.

The following burial traits were observed at the site, the artifacts being grave goods:

1. Copper repoussé plates depicting an "Eagle God" buried on the chest of a male adult.
2. Alba Barbed type arrowhead.
3. Bone awls reduced from a leg bone of a deer, sharp at one end, beveled at the other.
4. Antler tip implement.
5. Plain, circular stones, flattened, buried at sides of head.



Mangum Plates—Obverse



Mangum Plates—Reverse

FIG. 47.

6. Chunky stones.
7. Marine gastropod and pelecypod shells as ornaments and/or utensils.
8. Plaquemine horizon pottery, characterized by clay grit and charcoal paste.
9. Burials in groups of pairs.
10. Burials in circle, heads to center, bodies radiating outward. (Evidence of original finder, not checked by present excavation.)
11. Male and female pairs, one above the other.
12. Infants and children buried with adults.
13. Burial with head to east.
14. Cemetery of concentrated, superimposed burials on hilltop.
15. Burials in gastropod-filled detritus.

Thus, it may be concluded that the Southern Ceremonial Complex was present in southern Mississippi in Plaquemine times and was characterized by the familiar copper repoussé figuration on thin copper plate formed of sheets of native copper hammered together and often reinforced by riveting. The concept of an anthropomorphic feathered deity was present. The flesh (and possibly bundle) burials of many individuals accompanied that of the male who bore the copper plate and the female by his side.

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Washington, D. C.
October, 1951.

## A CARVED ANTLER HUMAN FACE FROM UMATILLA, OREGON

In the Lillard Collection primarily comprising archaeological materials from California now permanently housed in the University of California Museum of Anthropology, is a prehistoric artifact from Oregon which deserves special mention.

The specimen (Fig. 48) which is broken now measures 8.1 cm. in length, 3.7 cm. in width and .8 cm. in thickness. In cross section it is slightly curved from the natural contour of the original material. The inner convexity bears traces of the interior spongy or cancellous material of the antler.

The specimen portrays a human face with rounded cheeks and prominent nose surmounted by a band of vertical incised lines and capped by a crouching animal with exposed ribs.

All that is known of the piece is its provenience which is given as "Umatilla, Oregon." Some support to this attribution comes from the fact that the American Museum of Natural History collection contains a similar specimen from Umatilla and described by Smith (Harlan I. Smith. A Costumed Human Figure from Tampico, Washington. *Bull. of the Amer. Mus. of Nat. Hist.*, Vol. 20, Article 16, pp. 195-203, 1904). The American Museum specimen is even more fragmentary than ours, but it may be suggested that the two are almost identical except for the vertical lines

FIG. 48.

which cap the forehead. Smith's suggestion that "some animal . . . stood upon the human head" is definitely indicated as a fact from the piece presented here.

The original form of the two Umatilla pieces may have, as Smith suggests, been similar to that of the complete human figure from Tampico described by him in the paper just cited.

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April, 1951

## A CHINESE SOAPSTONE CARVING FROM YUCATAN

J. Alden Mason (1951) described two soapstone figurines which seemed to be of Chinese manufacture that have turned up in Mexico and Guatemala, respectively. In connection with these, I should like to call attention to still another object of the same substance, discovered in Yucatan, which is undoubtedly of Chinese manufacture.

Gann (1918) illustrates a "soapstone lamp" which he had found in a mound near Bacalar in Quintana Roo. He describes this "lamp" as decorated in front with a floral design and at the back by wing or feather-like ornaments possibly meant to represent the tail and half-folded wings of a bird, and remarks that its pleasing design and flowing lines are totally unlike the cramped and highly conventional style found in "similar small objects of ancient Maya manufacture." In fact, he remarked that it differed so widely from Maya standards that there could be little doubt that it was introduced

into the mound in post-Columbian days. He thought that, judging from the other objects found in the mound, which came from the latest period of Maya culture, this too might date from soon after the conquest. However, the fact that it had been found fairly near the surface also suggested to him that it might have been hidden in the mound at a much later date, possibly during the period of the Indian rebellions between 1840 and 1850, and might have had no connection with the original purpose of the mound.

This lamp could not possibly be of Mexican manufacture. It is obviously a Chinese representation of the fruit of the fingered citron of Eastern Asia (*Citrus medica var. sarcodactylus*), called in Chinese the "Buddha's Hand citron," *Fu shou kan*. This fruit, which is not found in the New World, has characteristic fingerlike processes, one of which has been fashioned into a spout for this vessel, while the rear portion is decorated with flowers and leaves of the same plant. Small pots of this particular form, with a large hole in the top and a smaller one at the end, were part of the regular desk equipment of Chinese scholars and scribes. They were used to hold the water for moistening the inkstone on which the sticks of ink were ground for writing with a brush. While the wealthier gentry often had these water pots made of jade or other semi-precious stones or of fine porcelain, poorer folk such as the small merchants usually had them made of *agalmatolite* or other soft stones, as this one is. A more elaborate one, representing the same fruit but made of chalcedony, was shown in the International Exhibition of Chinese Art in London in 1935.

The Buddha's hand citron was a popular symbol in China during the last dynasty (the Ch'ing, 1644-1911) because of a pun on its name, since *fu shou*, written with other characters, means "happiness and long life," and consequently anything made in this shape was thought to bring good fortune. Hence this object, which is fairly small (4¾ inches long by 1¾ inches high), could have been brought overseas as a lucky amulet, possibly by a Chinese coming to British Honduras, just south of Quintana Roo, where there have been Chinese in residence for many years.

Small water pots in this form have been made in China for at least two hundred years, but since this one was described as having been found near the surface, and since the photograph shows it to be still in good condition despite the softness of the material, it would seem that it had not lain buried for too many years. It certainly could not have been placed in the mound in pre-Columbian times or even "very soon after the conquest." Probably Gann's second suggestion of a mid-nineteenth century date for its deposit would not be too far from the truth.

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SCHUYLER V. R. CAMMANN
The University Museum
University of Pennsylvania
November, 1951.

## SUPPLEMENTARY NOTE ON THE ALEUTIAN CORE AND BLADE INDUSTRY

Completion of the analysis of the artifacts from Chaluka, the old village site at Nikolski, Umnak Island, has brought to light a number of new observations on the Aleutian core and blade industry, orginally described in *American Antiquity*, Vol. 17, No. 1, pp. 52-54. The use of lamellar flakes is part of the earliest Aleut culture and most of the flakes, four fifths, are found below the three meter level. This earliest Aleut culture was introduced by the paleo-Aleut people.

These flakes were used mainly for scrapers and retouched on only one surface and along one or both edges. Quite a few of these are tanged, apparently for end-hafting. A number have well-worked points which, together with their general form, suggests their use as gravers. There are also two adze blades, two knives and at least one projectile point which appears to have been made from lamellar flakes.

The materials are primarily greenstone, chert, altered lava and allied minerals, obsidian and andesite.

Of primary significance is the fact that no prepared cores have been found in our excavations, though there are other kinds of cores. This apparently indicates that the manufacture of lamellar flakes took place away from the habitation site, either at spots where specific kinds of preferred rocks were gathered, or while men were seated on top of observation hills watching the sea. The previously described site on Ananiuliak Island appears to be of the latter kind.

FIG. 49. Retouched lamellar flakes prepared for hafting.

FIG. 50. Retouched lamellar flakes.

Thus, the previous assertion of Laughlin that no lamellar flakes occurred in the Chaluke site is emended to conform to the fact that they are found, but without prepared cores, and primarily in the lower levels. Fig. 49 shows lamellar flakes and Fig. 50 shows lamellar flakes, scrapers and gravers from the lower levels of Chaluka. In conclusion it may be noted that the paucity of lamellar flakes in the upper three meters reflects one of the few essential changes in stone artifacts in the archaeological sequence.

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G. H. MARSH
J. W. LEACH
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University of Oregon
January, 1952

## PLASTIC REPRODUCTIONS

Those of us who have at one time or the other had the occasion to cast arrowheads or flints are aware of the disappointing lack of realism that plaster presents. Translucence is never present and too frequently the crisp retouch flake marks are lost under a coat of paint. More often, a successful reproduction is quickly ruined by careless handling.

After many trials that resulted in nothing more convincing than arrowpoints looking like painted plaster, the properties of various plastics were tested. Failure with liquid plastics led to experiments with powdered dental acrylic. This material, I found, had all of the properties required for faithful reproductions of stone flake work. The acrylic can be colored with pigments. It is strong, transparent, and can be molded to any desired shape with excellent detail without too much difficulty.

A process that proved to be very satisfactory consists simply of making a split mold of the object to be reproduced. This is done by imbedding one face of the arrowpoint in plastelene, placing a rectangular sheetmetal dam around the point with a half inch clearance between it and the dam. Fill this with a good grade of dental plaster. When set, this becomes one half of the split mold. Remove the dam and the plastelene without taking the point out of the dental plaster. Remove any material that may cover the point and cut four shallow keys into the plaster face for perfect matching of the halves. The whole surface, point and plaster, is covered liberally with vaseline. Allow this to set for five minutes or more so that the dental plaster can absorb some of the vaseline which acts as a separator when the other half of the mold is cast. The mold is completed by removing the excess vaseline, paying particular attention to the imbedded point, replacing the sheetmetal dam and pouring a layer of dental plaster on the keyed surface and arrowpoint. When thoroughly set, the halves of the mold will separate easily and the point can be removed without difficulty if the mold has been made properly.

The thickness of the mold halves is determined by the size of the object to be reproduced. One inch for each half is sufficient for a three-inch point. Stiff metal reinforcements should be added to the mold backs while the plaster is still soft. Molds that are reinforced will withstand the pressure required to make good reproductions whereas the ordinary mold will generally crack with the first attempt to compress the plastic therein.

The actual reproduction is made by treating the mold with a liquid separator that can be purchased with the plastic powder. After a shiny dry surface has been obtained on both halves of the mold by repeated applications of the separator fluid, the mold is set aside and the plastic is prepared according to the simple directions of the manufacturer. Waste material is greatly reduced by measuring the powdered plastic into each half of the mold and adding a little for error.

Color is added when the plastic is in the paste state. When the paste becomes like soft putty it must be placed in the mold and quickly closed. If the plastic becomes too stiff it will not be possible to close the mold properly and much detail will be lost. Placing the mold in "C" clamps or a vise will give sufficient pressure to force the plastic into all the mold details if the amount is as close to volume of the object cavity as possible.

The thin separator film is easily disturbed, therefore attempts to reopen the mold and rearrange the plastic paste to obtain better closure is not recommended. The plastic should be allowed to remain in the closed mold until it is completely cured (in accordance with directions of manufacturer), otherwise distortion and pitting will mar the reproduction.

By using this method I have been able to make convincing copies of many arrow and spear points. These have been roughly handled but the color, translucence, and detail have not suffered in the least.

ALBERT JEHLE
University of Pennsylvania Museum
January, 1952

# BOOK REVIEWS

*The Physical Anthropology of the American Indian.* WILLIAM S. LAUGHLIN, Editor. New York, The Viking Fund, Inc., 1951. vii+202 pp., numerous illustrations.

The six papers by as many authors contained in this volume, although significant contributions, hardly fulfill the ambitious covering title. Actually, on the inside cover the title is properly qualified by the words "Papers on . . ." Selected from a larger number of invited papers delivered at the Fourth Viking Fund Summer Seminar in Physical Anthropology held in September, 1949, these papers mostly unite in stressing the genetic approach to the study of man. The broad significance of each is all that will be pointed out here.

1. The Problem of the Early Peopling of the Americas as viewed from Asia, by Joseph B. Birdsell.

Out of Birdsell's work in Australia has grown a plausible explanation of the peopling of America that should make it embarrassing for anyone again to find Australoids and Melanesoids among the remains of our early Indians. Having noted that crosses between Australian aborigines (Murrayians) and Asiatics look like American Indians (these are illustrated), he makes out a good case for the Indians having resulted from a similar mixture between white ("Amurian") and mongoloid strains in ancient times. The Ainu, like the Murrayians of Australia, are surviving representatives of this ancient white strain.

Out of this study in turn grow suggestions for a new approach to racial analysis based on the techniques of population genetics. In this connection Birdsell lists promising phenotypic traits the study of which should aid in the solution of New World origins. Some of the traits, and especially those on the teeth, might be worked out on a combination of living and cranial materials. Others, like details of the hair, would have to be studied on the living. And still others require series of crania. Birdsell's account of his initial efforts to analyze nasal bone growth shows how the new technique can be applied. Altogether it is a well-presented and provocative contribution.

2. The Sequence of Indian Physical Types in South America, by Marshall T. Newman.

The materials on physical anthropology in the sixth volume of the Handbook of South American Indians are studied chronologically on the basis of archaeological assignments newly made by Gordon Willey. In the Handbook the arrangement was mainly geographical. Only lately has it become possible to do much with chronology in South America. However, the inadequacies of these materials for large reconstructions, such as Imbelloni's type classification, are clearly shown. Indeed, Imbelloni's classification is singled out for critical analysis. In Newman's own words,

> . . . it seems obvious that the impressionistic ultra-migrationist approach of Imbelloni as well as the more empirical method of this paper have failed to delineate demonstrable sequences of racial types in South America because both have been forced to use almost totally inadequate data. In addition, Imbelloni's call upon the Old World to explain the New places him in a theoretical position he may find difficult to defend. There can be no argument, however, that the successful demonstration of local sequences by use of both distributional and chronological approaches will constitute the first steps in constructing a valid continental history of race.

3. The Alaska Gateway Viewed from the Aleutian Islands, by William S. Laughlin.

From first-hand knowledge of the Aleutians due to membership in Hrdlicka's 1938 expedition and in the Peabody Museum, Harvard University, Aleutian Expedition of 1948, Laughlin summarizes the anthropometry of the area, both for the skeleton and for the living. Supplementary data are given on dentition, blood groups, and population size. On this basis the Aleuts are shown to have closer affiliations with the neighboring Eskimo than with the Indians. A so-called pre-Aleut type has persisted in the western part of the island chain, but was supplanted in the east by the later and physically different Aleut. Now for the first time the physical anthropology of this area makes sense.

Looking at these northern peoples more broadly, Laughlin subscribes to Kroeber's observation that

> . . . our concept of what is Eskimo is due to first an approach from Greenland, and next Labrador, Baffinland and the Central region. Had our knowledge begun in Alaska, where population centers and where the density is overwhelming, our most "typical" Eskimo would probably seem merely peripherally reduced and atypical.

4. The Blood Groups and Types, by William C. Boyd.

Owing to the scarcity of New World data on the newer blood groups and types and to the existence of recent reviews of this subject, Boyd's paper is lacking somewhat in novelty. Nevertheless, this field still represents the most advanced application of genetic principles to anthropological problems.

Boyd (and there are few better qualified to discuss the subject) now sees no convincing evidence of the existence of blood group B in American Indians except as introduced by mixture with whites. He thinks "it is possible that as a matter of accident, no blood group B individual was represented, or at least none of his descendants who carried this gene survived to contribute to the future population."

5. The Dentition of the American Indian, by Albert A. Dahlberg.

It is rare for a practicing dentist to have both time and interest to devote to the anthropological problems of teeth. Having made extensive records of the teeth of Pima Indians (photographs of dental impressions are given), Dahlberg here follows up his interest by summarizing much of the scattered data of the literature, both observational and metrical. Emerging from this summary is a pattern of relative stability within the four tooth groups—incisors, canines, premolars and molars. Also, of course, the dental specializations of the Indians are clearly shown. Thus order is brought into what has been a highly confused field.

Dahlberg describes the Indian dentition

. . . as having large teeth, pronounced shovel-shaped incisors with occasional barrel-shaped lateral incisors, triangular occlusal surfaces on lower first deciduous molars, a high incidence of three-cusped upper second and third molars, a high incidence of Y5 patterns on lower first permanent molars, a high percentage of + grooved and five cusped second and third lower molars and a low percentage of small Carabelli's cusp.

6. Some Genetic Variations in American Indians, by James N. Spuhler.

The first extensive effort to study a series of genetic traits in an Indian group was made by Spuhler on the Ramah Navaho. On the basis of this experience he describes eight traits with "known" genotypes, which are frequent in most populations and which have been studied in at least one other Indian group. These traits are: Secretor factor, PTC taste reaction, Phlebograms of the anterior thorax, Color perception, Occipital (lambdoidal) hair whorl, Palmaris longus muscle, Peroneus tertius muscle, and Number of vallate papillae. Although the conclusions necessarily must be tentative so far as American Indian groups are concerned, it is clear that the Indians have close mongoloid affinities. This paper will serve as an introduction not only to a new field but to Spuhler's forthcoming detailed reports.

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*Archeology of the Bynum Mounds, Mississippi.* JOHN L. COTTER AND JOHN M. CORBETT, with additions by MARSHALL T. NEWMAN, VOLNEY H. JONES, HENRY W. SETZER, and J. P. E. MORRISON. Archaeological Research Series No. 1, National Park Service, U.S. Department of the Interior, Washington, 1951.

With this report the National Park Service inaugurates a series that will be welcomed with enthusiasm by all those interested in American archaeology and related subjects. The field work and report, both in content and in format, set a high standard which will surprise no one who has had dealings with that branch of the Government. If the present reviewer seems to devote an undue amount of space to critical remarks, it is because the good points are sufficiently obvious. The field work was competent and thorough and is described in great and praiseworthy detail. No one could complain of insufficiency of data on what was done and what was found. The report is well illustrated and presents in tabular form more of the analysis data than are usually furnished. There are excellent supplementary reports on the physical anthropology by Marshall T. Newman, vegetable material by Volney H. Jones, animal bones by Henry W. Setzer, and on the shell remains by J. P. E. Morrison. In sum, that ideal, often referred to but seldom practiced, of giving enough information to enable the reader to reconstruct the site and put the artifacts back *in situ* is nearly realized. Such being the case, interpretations are not so vital; the data can be re-interpreted as much and as often as is necessary with increase of knowledge and refocussing of problems. We need not accept anything on trust, which is fortunate inasmuch as there are in the interpretive sections several internal inconsistencies, some of which will be pointed out below.

The Bynum site is at the southern extremity of Pontotoc Ridge in Chickasaw County, northeastern Mississippi, on the old Natchez Trace, to which fact we are indebted for its excavation by the Park Service. It consists of six small conical mounds and an extensive village area. Five of the mounds were excavated and a considerable part of the village site was uncovered, disclosing seven circular post-hole patterns with diameters up to 78 feet. The yield of potsherds was abundant, but apart from burial offerings in the mounds the artifact inventory was remarkably meagre. Pottery therefore carries the principal weight of interpretation.

The mounds contained extended burials and cremations on the base and in subfloor pits. Notable among the offerings were copper "ear spools" of double cymbal type, which were placed at the wrists instead of the ears (the authors call them simply "spools"); some of these were filled with powdered galena. The village site contained flexed burials without offerings. Skeletal material was in poor condition, and Newman was able to type only eight skulls: a deformed Centralid from one of the mounds, four undeformed Sylvids from the village area, two Centralids and one Sylvid from some historic Chickasaw burials on the site.

The dominant pottery types were those already described by Jennings from sites in Lee County, Mississippi, a short distance to the northeast. In addition there were minority elements of limestone-tempered ware, the sand-tempered Alexander series and Marksville.

There was next to no stratigraphy, but by careful analysis and close reasoning a sequence of features and mounds was worked out that seems to give considerable chronological depth to the site. One very definite contribution to Jennings' Lee County sequence was determination of the priority of sand-tempered fabric-impressed pottery (Saltillo) over sand-tempered cord-marked (Furrs), a relationship that was to be expected but had not been previously established in northeast Mississippi. There was no fibre-tempered ware, so the sequence at Bynum begins with sand-tempered plain and fabric-impressed (Baldwin and Saltillo), followed by sand-tempered cord-marked (Furrs) and clay-tempered plain and cord-marked (Tishomingo), in that order.

Placement of some of the minority wares is a little ambiguous. On page 20 the limestone-tempered pottery is said to have been introduced at Bynum "subsequent to the sand-tempered series and either contemporaneous with or just before the clay-grit series," but on page 30 we read "generally accompanying the sand-tempered wares are the limestone." The two statements are irreconcilable. The Alexander sherds were few and dubious and were judged to have come in by trade "sometime during the mound erection period" (p. 21).

But on page 32 it is suggested that full Alexander influence was not felt at Bynum, "possibly because it was already on the wane by the time Bynum was inhabited." This is a reasonable estimate, but we should then expect to find Alexander in the earliest deposits on the site, not in the later "mound erection period." The Marksville intrusion was slight but has a lot to do with dating the site. It was in the "later part of the sand-tempered period," which is also, I take it, the period of mound erection referred to above. This is fine for Marksville, but we would not expect to find it and Alexander in deposits of the same age.

These are perhaps minor discrepancies, and I may have made too much of them. The over-all dating of the site appears to be perfectly sound. In terms of Jennings' Lee County sequence, Bynum runs from a time "soon after" the beginning of Miller I, through Miller II, and well into Miller III; in other words, practically the entire Burial Mound (early and middle Woodland) period as now defined. How this can be equated with the statement on page 2 that the entire occupation "lasted perhaps 100 or 200 years" I leave for the reader to determine. Even the distinguished editor of this journal, who was "remarkably close-fisted with the centuries" (to borrow a phrase from Howells) when he worked in the Southeast, allowed more time than that to the Burial Mound period. As a matter of fact, in Chart I (p. 33) the authors give Bynum a run of about 500-600 years.

The sections devoted to wider comparisons by means of trait lists the reviewer does not feel competent to judge, this being a method he has never fully understood. There is a sort of informal trait comparison with Miller, Copena, Adena, and Tchefuncte-Marksville (pp. 55-56), followed by a more rigorous comparison with Miller, Copena, Marksville, McQuorquodale, and Hamilton (p. 57 and Table I). The two operations are distinct and apparently are not done in the same way. The first shows closest relationship of Bynum to Copena with "about one third agreement"; the second also puts Copena in the lead in mound traits, with 87.7 per cent agreement, but second to Miller in village traits with only 56.4 per cent. But even 56.4 per cent is much more than one third. These figures puzzled me for a time, and I even went so far as to wonder whether there might be something queer about a system that could give such discrepant results.

The first operation matched the Bynum data (list not given) against Webb's 1942 list of 108 Copena traits; the second matched the Copena data (source not given, but presumably Webb) against a Bynum list of 67 traits. In other words, the first operation determined the percentage of Copena traits that occurred at Bynum, whereas the second determined the percentage of Bynum traits that occurred in Copena, which is not the same thing at all. A discrepancy is mathematically inherent, but what it would amount to is beyond the range of my feeble mathematics. In any case it is not the whole story, since obviously the same lists were not employed in the two operations, only 28 correspondences being noted in the first as against 46 in the second.

Were more space available, I should like to comment on the use, in comparisons of closely related cultures, of such traits as: site in vicinity of large river, scattered post molds, stemmed points, scrapers, knives, drills, round-bottomed vessels, deer bones, corn (inferred), refuse pits, random burials, pitted stones, twined cord, and plain pottery. What significance can attach to percentages of correspondence in which *burials with copper spools* and *deer bones* are mathematically treated as units of equivalent value? This is not a further criticism of the Bynum report but rather a criticism of an accepted method of culture comparison, which the authors employ (somewhat half-heartedly, I feel) but do not depend on finally for their results.

Apart from the mathematical discrepancies, it seems to me that the comparative statements are impaired by the fact that the authors have not made up their minds whether they are dealing with one or several components in the site. Most of the village site is thought to be earlier than the mounds, but apparently no break in continuity was indicated between them. The authors incline to the view, however, that the clay-tempered ware was introduced by a new "slightly different" group of people, the shift taking place during the period of mound building, after the erection of Mound D but before A and B. The argument is carefully set forth on page 53 and is summed up in the conclusions (p. 57) as follows:

> It is reasonable to present the *first occupation* at Bynum as possibly contemporary with late Archaic in Louisiana, northern Mississippi, and Alabama, and prior to the fully developed Copena. *Subsequent occupation* featuring clay-grit cordmarked pottery, extraneous wares, and oval pit graves may extend the temporal span upward. (Italics the reviewer's)

This is reasonable enough, except that I do not agree that it started in the Archaic (a question of definition); but in the next paragraph we read:

> The Bynum site can thus be regarded as a *component* with close affiliation with Miller II, Copena, and Marksville foci, and definite affinity with McQuorquodale of southern Alabama and Hamilton focus of middle Tennessee aspect, within the Hopewellian phase and ultimately within a general Woodland pattern. (Italics the reviewer's)

This certainly suggests a single occupation and a relatively short time span, almost a return to the opinion of page 2 that the total occupation lasted no more than a century or two.

Except for the confusion it may have caused, the question of one or several components is a minor one. More important is the final placement of the site culturally and chronologically. This is summed up in the passage just quoted; but earlier on the same page it is stated in surprisingly different fashion:

> The framework within which the prehistoric period of the Bynum site fits is a general southern Hopewellian manifestation with many Woodland determinants present. These manifestations come within the general horizon of what has been termed Burial Mound I in this region.

Could this be a misprint for Burial Mound II? Apparently not, for we have already called attention to the statement that the occupation may have begun in the late Archaic. This is the first suggestion I have encountered that southern Hopewell, however defined, falls in Burial Mound I. With the exception of McQuorquodale, all the cultures with which Bynum has been compared in this report—Miller II, Copena, Marksville, Hamilton—have been regarded by the best authorities as Burial Mound II or Middle Woodland groups. Let me hasten to add that the best authorities may be wrong, but what new information or new definitions have arisen to make them so? This is quite a bomb-shell to be so quietly dropped on the last page of a site report. Nothing in the earlier portions of the text has prepared us for such a conclusion. The excellent ceramic analysis (pp. 17-35) as summarized in Chart I (p. 33) demonstrates that the occupation at Bynum, whether one or several components, lasted throughout the Burial Mound period, I and II, as presently defined. In view of the fact that pottery, as already pointed out, carries most of the weight of the interpretation, it is with this conclusion, I think, that most of us will agree.

There is in my opinion a general explanation for the lack of internal consistency which has perhaps been too heavily underlined in this review. One has the impression that it is a "transitional" work. It represents a phase of uncertainty with respect to method through which eastern archaeology is passing. Without raking up old embers, it certainly can be maintained that the majority of eastern archaeologists are losing contact with the midwestern taxonomic method and concentrating their attention, perhaps unduly, on what is grandiloquently called "space-time systematics." Regardless of which side the angels are on, certainly—as the Bynum report illustrates—they are not on both sides, at least not at the same time. It is impossible to mingle interpretations based on the shifting proportional relationships of pottery types through time, on the one hand, with those based on broad static one-to-one correlations, in which duration and variability within the cultures compared are happily ignored, on the other. These are simply operations on two different levels of abstraction. Both may be equally valid and useful, but they mix like oil and water. It is especially regrettable that the effects of this unfortunate mixture show up in the Bynum site report precisely in those sections that will be read first—the comparisons and conclusions—for there is in the main body of the work a great deal of sound sense that may not get the attention it deserves.

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*An Archaeological Survey of Guntersville Basin on the Tennessee River in Northern Alabama.* WILLIAM S. WEBB AND CHARLES G. WILDER. University of Kentucky Press, Lexington, Kentucky, 1951. 278 pages, 78 plates, 2 maps, 2 plans, 1 table.

This is the fourth major report by Dr. Webb and his associates on the extensive excavations in the Southeast which were sponsored by various governmental agencies. "This volume is a report on a series of archaeological excavations in the Guntersville Basin on the Tennessee River in northern Alabama. The field work covered a period of more than twenty months in 1938–1939." The original report was completed in 1941, but its publication was delayed due to the war. It has been issued by the University of Kentucky but, unfortunately, in an abbreviated form. It is not stated what sections or portions of the original manuscript were omitted.

The character of the report is clearly stated by the authors.

> The limited time available for the study of so vast an amount of material as was yielded by the Guntersville Basin made a complete and thorough analysis of the relation of these sites with the other known cultural manifestations of the southeastern United States quite impossible. For this reason the authors could do little more than report the factual data from the sites excavated and suggest a tentative relative chronology for the area. In terms of this suggested chronology in the closing paragraph of the report on each site the authors have indicated the site's chronological placement.

Twenty-seven sites were excavated and are reported upon in this volume. The descriptions of a number of sites which were excavated do not appear in this compilation. The emphasis in the report is on the presentation of essential data of the excavations, on the cultural material, and on the evidence of buildings and other features. There are two maps and ground plans for two sites. For most of the sites where sufficient information was obtained, trait lists, burial listings, pottery type charts, and projectile type counts are aids to a comprehension of significant data. The field work as presented by the illustrations and the text was outstanding and reflects credit on the entire organization.

No attempt is made in this volume to portray an integrated living culture of any of the major archaeological units. Copena is discussed in a summary chapter and a trait list for this unit presented. The chronological framework for all of the sites is called Gunterlands I to V. The defining characteristic for each period is given on page 269, and a brief paragraph on each of these "periods" provides some help in understanding the temporal divisions. Not only are the sites or their subdivisions not placed in an eastern or southeastern cultural framework, but also they are not even correlated or interpreted in terms of other sites in this same volume or the previously reported data by the same group of archaeologists. This implies, I assume, that there is in preparation a volume which will present an interpretative prehistory of northern Alabama in which the progressive changes which have taken place through time will be given in terms of culture history, and the

local complexes which are a part of widespread eastern cultural levels will be adequately characterized. One looks in vain for an adequate assessment or description of the complex of traits which was in existence in "Gunterlands" during any one of the "periods." Even with Copena, the list of sites and traits is incomplete. The considerable village occupation during Gunterlands III, to which Copena is assigned, seems to have no significance in regard to the possible living quarters of the Copena burial complex. On the other hand, the absence of Gunterlands III burials is viewed with some concern.

Gunterlands I is a period from the first evidence of human occupation to the introduction of fiber-tempered pottery. This period is not well represented in the sites dug, as only the Benson site, Ja°42, had a clearly defined non-ceramic level. Gunterlands II—the fiber-tempered pottery period—is also not well represented; the Cox sites, Ja°176 and Ja°176A, are the only ones with much evidence of this "period." Most of the sites are either Gunterlands III — the limestone-tempered pottery — or this material plus the subsequent two periods. This Gunterlands III period, however, is nowhere sufficiently described nor is much done with the obvious diversity of material within it. Gunterlands IV is the shell-tempered pottery period and is rather well represented. Here too the illustrations, site description, artifact lists, and pottery types indicate that significant cultural and chronological groupings exist, and their importance could well have been made the subject of comment. There is a considerable amount of European trade material in a number of sites, and the Guntersville area is one through which DeSoto is said to have travelled. If the association of this European material was regarded as a temporal problem, that is, to determine whether it is sixteenth, seventeenth or eighteenth century, the solution is not found in this volume. Neither is there any statement as to the possible tribal group or groups which might have deposited these foreign trinkets with their dead and in their villages.

The projectile points were classified on the basis of shape and grouped into 23 types lettered from A to W. There is a chart facing page 278 which gives many identifying features of these types, and they are illustrated in Plates 77 and 78. One looks in vain, however, for the cultural alignment of projectiles or for a key relating this typology to that employed in the Pickwick Basin report. Another classification was apparently made of celt forms, for in some sites we find letter designations such as E and F, but this is not consistently done, and there is no definition or description of these groups or any assignment to a cultural group or period.

The ceramic typology and listing were certainly adequate for the period when they were made, and this section of the report, presumably prepared by Miss Dunlevy, is almost the only one in which the material is interpreted as indicating temporal changes. It is difficult to see what would be contained in her future report, mentioned on page 7, except for a summary interpretive statement, for the bulk of her data minus the illustrations is in the Guntersville report. The implication is given on page 7 that there are pottery type descriptions in this report. This is, unfortunately, not the case.

There are a number of references in the pottery descriptions to illustrations which were probably in the original manuscript but which were omitted in this report. From the statement on page 137, lines 11 to 15, one might be persuaded that corn, beans, and peaches, along with acorns and nut hulls formed part of the diet of the pre-ceramic period in the Guntersville basin! Most of the ceramic charts are presented beginning with the top level. At the Langston Mound, Ja°9A, page 173, however, the "first level" is the earliest at the site and the "third level" is from the surface. This presentation is also followed for features on page 192. There is a reference on page 193 to a podal support with fabric marking on Plate 53, D 7. This looks unusually large for such a support and is not fabric marked. There are additional errors in identification and level attribution on page 192 to Plate 53 D. The data in the Copena trait list, pages 274-275, for the Hog Island and Alexander sites dug by Gerard Fowke are in the 44th Annual Report of the Bureau of American Ethnology. The trait list for these sites is incomplete.

From January, 1934 to the close of relief archaeology in 1941, W. S. Webb was a major factor in the excavation of some 86 or more sites in the Tennessee Valley. On these Webb has seen that the essential data has been published. The excavation program was supported by various governmental agencies throughout the years of its existence and was sponsored by at least two state institutions. There were not only frequent changes in the laboring personnel but also in the field and laboratory supervisors. The excavation work was accomplished under unusual pressures and with many disastrous setbacks. The immense amount of material uncovered was cleaned, catalogued, studied and recorded. This was an enormous task and was most ably performed. The collections from northern Alabama are in Moundville State Park. To Webb and his associates go the respect and applause due for their conscientious and successful labors. As long as archaeology is studied, their reports and collections will be prime sources.

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*A Survey of Indian River Archaeology, Florida.* Irving Rouse. Yale University Publications in Anthropology No. 44, pp. 296, 8 pls. 15 text figs., 4 tables. With appendices by C. D. Higgs and C. W. Goff. *Chronology at South Indian Field, Florida.* Vera Masius Ferguson. Yale University Publications in Anthropology No. 45, pp. 62, 4 pls., 10 text figs., 7 tables. With an appendix by M. Van Winkle Houck. (New Haven, 1951. Bound as a unit: $4.00.)

The Indian River archaeological area of Florida, on the east-central side of the peninsula, centers around the Indian River coastal lagoon and the upper course of

the St. Johns River. It is defined as being 120 miles north-south and about 30 miles east-west with a western boundary at the edge of the central Floridian tableland. Culturally, it is a zone of low distinctiveness. Geographically intermediate between the northern St. Johns and the Glades-Kissimmee areas, it has been said to show a blend of both St. Johns and Glades traits without sharing in the best achievements of either of these regions. In a broad perspective of eastern United States prehistory the Indian River area maintains a marginality expressed in the absence of agriculture and the temple mound complex, the retention of burial mounds until the historic period, and the strong continuity of local ceramic traditions that were amazingly resistant to modification from outside.

Aboriginal cultural development within the area may be recapitulated in a series of six major periods: (1) Pre-ceramic; (2) Orange; (3) Malabar I; (4) Malabar I'; (5) Malabar II; (6) St. Augustine. Subsequent to the St. Augustine period, which is terminated as of 1763 A.D., were the successive Seminole and American occupations. The Pre-ceramic and Orange periods are Archaic manifestations. Bone implements and ornaments of both periods and the fibre-tempered pottery of the Orange levels relate to similar finds on the Northern St. Johns and elsewhere in the southeastern United States. Malabar I period introduces the soft, chalky ware of the St. Johns series which replaces the fibre-tempered pottery but which shows incised decoration reminiscent of it. Malabar 1 period chalky ware drops out the incised decoration. In Malabar II, checkstamped chalky ware is the diagnostic pottery type, burial mounds are the vogue, and European trade goods appear in the latter part of the period. St. Augustine is the very late native development which is under strong European influence radiating out of the Spanish base at St. Augustine.

In the Indian River survey Rouse set for himself three problems or problem lines. The first of these was to determine the cultural content of the ceramic sequence, a sequence which he, in part, established during the progress of the survey and to which Goggin and Ferguson, as well as others, had contributed. The second objective was the correlation of the ceramic and cultural sequence with geological-ecological changes in the region. And the third goal was that of relating the sequence to documented historical happenings concerning both Indians and European invaders. Implicit in all of this is also the basic aim of injecting order and systematization into the fairly ample but very diffuse archaeological data which exist for the Indian River area. In all of these objectives Rouse scores more than adequately, and in one, the geological-ecological correlations with culture periods, he rates an exceptionally high mark. To date, there has been little archaeological work in the southeastern United States which deals with factors of climatic or topographic change. Exceptions are John M. Goggin's brief paper, "Florida Archaeology and Recent Ecological Changes," *Journal of the Washington Academy of Sciences*, Vol. 38, pp. 225-233, and a forthcoming detailed study of river channel correlations in the central Mississippi Valley by Phillips, Ford, and Griffin (Papers of the Peabody Museum, Harvard). Rouse has shown the possibilities in this approach, and, in so doing, has contributed not only to the solution of his own archaeological problems but has thrown considerable light upon the controversial Melbourne and Vero "Early Man" finds.

The geological-archaeological analysis is extremely thorough. The reader is first briefed on the geological stratification; Anastasia (sea inundation of much of Florida — correlated with third interglacial); Anastasia–Melbourne interval (sea withdrawal — weathering of Anastasia formations — correlated with last glacial; Melbourne (sea rise to about present level — fossils of extinct land mammals and birds); Melbourne–Van Valkenburg interval (sea recession — weathering of Melbourne formations — relatively dry period); Van Valkenburg (sea rise to present level — swampy, modern conditions). Rouse then argues that the sea level changes which affected east Florida were *eustatic*, or entirely the result of the rising and lowering of the seas themselves, not *isostatic*, or resulting from local land uplift. Accepting this, the Florida sea level oscillations can be correlated with rises and subsidences of the sea in other parts of the world. Cross-correlations with similar changes in southern Britain suggest an estimated date of 2000 B.C. for the close of the Melbourne interval and the beginning of the Melbourne–Van Valkenburg stage. It is with this latter geologic time that the first periods of the archaeological sequence, the Pre-ceramic and the Orange, may be correlated. This is done by demonstrating that sites of these periods are often situated in locations which are no longer habitable as the result of recent elevation of the sea level and the water table. Also, it is fairly certain that the Indian River lagoon was dry or nearly so during the Melbourne-Van Valkenburg interval. As a result, sites of the Pre-ceramic and Orange periods are not found along the lagoon but near the St. Johns River. These early St. Johns River sites are, significantly, composed of fresh water, not marine, shellfish.

The well-known Vero and Melbourne finds depended for their great antiquity upon their association with the fossil bone beds of the Melbourne stage formation. It is Rouse's considered opinion that the Vero and Melbourne human bones and artifacts were, in every case, intrusive into the Melbourne stratum from the later Melbourne–Van Valkenburg interval. As such, Vero and Melbourne "men" are most reasonably considered contemporaneous with either the Pre-ceramic or Orange periods. This does not preclude the possibility that human evidences dating from the Melbourne interval will eventually be discovered in Florida, but as the case now stands man does not appear on the scene until the dry Melbourne–Van Valkenburg geological period.

Further archaeological-ecological correlations are made between the Malabar I or I' periods and the Van Val-

kenburg interval. At this time a rising sea began to fill the Indian River lagoon, and, as a consequence, the Malabar sites are frequently located on the lagoon and consist of marine molluscs. The dating estimates for the beginning of Malabar I and I′ periods are placed at the start of the Christian era.

Subsequent dates for the archaeological sequence are either "guess-estimates," such as 1000 A.D. for the beginnings of Malabar II, or they are founded upon combined ethnohistorical and archaeological information.

Of significance in relating historical events to the archaeological sequence was the manuscript of the Spanish soldier, Alvaro Mexia. This document, translated and annotated by Mr. Charles D. Higgs, is published as an appendix to Rouse's report. Mexia, an agent of Governor Ybarra of Florida, was dispatched from St. Augustine in 1605 to treat with the Ais Indians. The Ais were, at this time, in possession of what has been archaeologically defined as the Indian River culture area. Through Mexia's manuscript and map it was possible to be more certain of their habitat and to clear up an earlier error concerning the location of the Timucuan-speaking Surruque. Following Mexia, there is little doubt that the Surruque lived north of Cape Canaveral on Mosquito inlet and were outside the Indian River area. The ethnohistory of the Ais and their relations with the Europeans serve as a means of calibrating the latter part of the Malabar II culture sequence and the St. Augustine period. The years between 1512 and 1563 are described as an exploratory era in which the Ais had little contact with the Spanish, except by way of shipwrecks. Trade artifacts of this time are, thus, at a minimum. The years between 1564 and 1602 are described as a period of "Hostility," during which the Ais plundered wrecked Spanish and other European vessels and killed or enslaved their survivors. From 1603 until 1703 was a century of "Friendship," and trade with St. Augustine was markedly increased. A quantity of European-made axes, knives, and mirrors characterize the archaeological sites of this period. The "Ais Decline" lasted from 1703 to 1763, and it corresponds to the withering of the native culture under Spanish impact. This was also a time of shifting Indian populations with many north Florida mission Indians moving southward. "Seminole Ascendency," which follows the "Ais Decline," is known historically although not archaeologically.

Rouse is, perhaps, least successful in the remaining objective, that of the determination of cultural content of the archaeological periods themselves. This is the core of the report, and the data from over 100 surveyed or excavated archaeological sites are competently handled; but the conclusions lack the definitive quality of the ecological or ethnohistorical results. The Malabar I period is, as the author admits, largely hypothetical, and there seems to be a certain amount of straining here to produce a period that will equate with a Deptford (or Santa Rosa–Swift Creek?) level on the west coast. Similarly, Malabar I′ is weakly represented and not fully satisfactory. In general, this is a puzzling segment of the chronology, not only for the Indian River area but for other parts of Florida and the southeast as well. Rouse is not to blame that the data from this strategic point in the Indian River sequence are so few and fuzzy, but we cannot help lament that there is not more to offer for this important time of transition between the fibre-tempered pottery horizon and the inception of the chalky ware tradition. Somewhere at about this time the burial mound trait first appears as there is slight but not completely conclusive evidence for it in Malabar I′. The polished stone celt is dated as Malabar I and the platform pipe in Malabar I′. Also, in these early Malabar periods can be placed the first appearance of a meso- or brachy-cranic physical type that stands in contrast to the earlier Archaic long-heads. By the time we reach Malabar II the ground is firmer, and a burial mound-checkstamped pottery complex can be surely equated with the Weeden Island culture to the west. Whether this is a full Weeden Island equation or only a late Weeden Island cross-dating is uncertain.

Vera Masius Ferguson's paper, on the stratigraphy at the site of South Indian Field, parallels and supports Rouse's more general survey. The South Indian Field site for some years previous to 1944, had been under study by the owner, Mr. A. T. Anderson. Rouse reports upon Mr. Anderson's excavations, and Ferguson's stratigraphic testing was carried out as a check upon this earlier work. The South Indian Field ceramic stratigraphy demonstrates clearly the superimposition of the chalky St. Johns series pottery, over sand and grit-tempered Orange series ware. Ferguson weighs the possibilities of interpreting this stratigraphy as cultural change through continuity or change through a break in occupation with a probable replacement of population. She concludes by favoring the second interpretation, attributing the combined presence of the fibre-tempered and other wares in the same upper levels of the midden as the result of mechanical rather than cultural mixture. On evidence presented this seems the more likely of the two explanations. Certain incised designs on St. Johns ware do, it is true, bear a resemblance to the fibre-tempered type, Orange Incised, but I am inclined to believe that this transfer of design elements took place elsewhere than at the South Indian Field site. Ferguson's attempts to split the St. Johns chalky wares into Malabar I and Malabar II periods, as these have been defined by Rouse, were inconclusive. St. Johns Incised and St. Johns Check Stamped were both present in her midden cuts, but the relationships of these two types do not clearly demonstrate the priority of the incised type.

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*The Terra Ceia Site, Manatee County, Florida.* RIPLEY P. BULLEN. Florida Anthropological Society Publications, Number 3. $0.50.

This report maintains the standard for excellent presentation set by the preceding two numbers in the Florida Series. With the steady appearance of these uniformly good reports in this and other series, Florida is rapidly becoming one of our best known archaeological areas.

Bullen does an accurate and concise job of presenting the reader with the essential "what" and "where" information produced by the excavations. Relevant comparative material is similarly introduced at appropriate points in an equally concise manner. A minor objection is with the charts which give the numbers of sherds of each pottery type found, by level; the numbers have not been reduced to percentages, which would be a help. The most important thing is that the types were there, but the next point to be considered is their relative importance at a given time, or stratigraphic level.

The Terra Ceia site includes a number of features bearing separate names. These are the Boots Point and Abel shell middens, the Johnson and Prine burial mounds, and the Bickel mound. The latter is a temple mound, with ramp approach, and is the main feature of Madeira Bickel State Park. It faces the village area, marked by the shell middens, across a plaza kept clear of occupational debris.

Test trenches in the shell middens, which had been in large part removed for building, yielded numerous sherds, almost entirely plain ware, most of it sand-tempered. As Bullen carefully points out, the sherds might be of the Glades, Deptford, Santa Rosa–Swift Creek, Weeden Island or Safety Harbor complexes. The next most important type is limestone-tempered plain, which is scarcely more diagnostic.

In view of this, Bullen feels that the finding of three sherds, possibly Miami Incised, in the middle levels of the cut into the twelve-foot-deep midden, indicates a temporal position for these levels equivalent to Goggins Glades IIa and Willey's Perico Island, or generally early to middle Woodland. In the higher levels of the same midden, six sherds of Biscayne Red were found, which are taken to indicate equivalency with the Weeden Island period.

From these correlations, plus the deep strata with only plain ware beneath the levels with the Incised type, and the finding of Safety Harbor types in the smallest collection, a span of eight hundred years for the site is deduced, Glades I to Safety Harbor. This is probably the best conclusion which can be drawn from the midden data, but, as Bullen obviously realizes, it can be little more than an informed guess on the basis of such scanty evidence.

The Bickel Temple mound, 100 by 170 by 20 feet, was constructed of sand, shell, and village debris. Limited excavations produced only plain sherds, and no attempt is made to estimate the period of construction and use.

A short distance north, also in the Madeira Bickel State Park, is the Prine burial mound. The eastern half of this mound had been dug over previous to the park work, so that controlled excavation was possible only in the western half. Flexed burials were found in graves in the original ground surface, and two extended burials, with at least eighteen more individuals in bundle burials, single skulls, and long bone bundles in a higher zone. The pottery collection, largely from the upper zone, included the amazing number of fifty-six types. They are tabulated, with depth occurrence, in one table, accompanied by a discussion of their significance. The Weeden Island complex types predominate in the decorated ware, the remainder of the collection, other than the omnipresent plain sherds, consisting of a few Safety Harbor sherds, a few of the Englewood complex, a few of the Glades complex, and possibly one sherd of Alligator Bayou Stamped, a Santa Rosa–Swift Creek type.

Since the collection is predominantly Weeden Island, the conclusion is drawn, using the depth data, that the mound was started in Weeden Island I times, was used largely in Weeden Island II, and still had a few additions made in the Safety Harbor period, suggesting that the mound was in use for burials over three hundred and fifty years.

The reviewer is forced to disagree with this conclusion. Since there are few Safety Harbor sherds, and they are limited to the top foot of the mound with one exception, Safety Harbor burials could only be intrusive. A second point is in relationship to the Weeden Island I–Weeden Island II picture. If the Complicated Stamp types and Wakulla Check Stamp are considered indicative of these two periods, the periods are coexistent on the basis of depth occurrence of pottery as presented in the chart for the Prine mound. Wakulla Check Stamp is as important, or as unimportant, as the complicated stamp at all levels. A picture of replacement of one by the other, in terms of relative importance per level, is not to be found.

Since there is a difference in the type of burial, particularly as between the flexed types in the mound base and bundle burials higher up, this is correlated with the pottery data. Flexed burials then are considered to be Weeden Island I and the bundle, Weeden Island II, with possibly a few made in the early Safety Harbor period. A few prone extended burials, recorded as having been removed from the top of the mound before the Florida Park Service dig, are believed to have been Middle–Late Safety Harbor or Historic. This correlation of course fits neatly with the pottery sequence, as interpreted by Bullen.

In the conclusion, Bullen deals adequately with the question of Terra Ceia as a possible location for the site of Ucita, visited by DeSoto. His position on this question is an emphatic negative. He also deals adequately with the relationships to other recorded sites in the immediate area, as Perico, Weeden Island, Thomas, Englewood, and Cockroach Key. From a brief comparison, the conclusion is drawn that time spans were roughly equivalent. Unfortunately Bullen, like Willey,

from whom he draws, is handicapped by the extremely poor excavation of these sites. However, it is clear that similar stratigraphy in burial types as well as roughly equivalent ceramic series were present in them. Having some advance information, the reviewer feels certain that the nature of the burial stratigraphy in these sites was misinterpreted, which may change the total picture.

One also wonders why the temple mound, burial mounds, and village area at Terra Ceia may not represent the major occupation of the site, in the Weeden Island time period, dated by the specialized types of the Weeden Island series in the Prine burial mound.

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*The Cohonina Culture of Northwestern Arizona.* John C. McGregor. University of Illinois Press, Urbana, 1951. 158 pp., 39 figs., 15 tables.

This welcome volume is a report on a summer's excavation in Cohonina sites conducted jointly by the Museum of Northern Arizona and the University of Illinois near U. S. highway 64 between Williams and Grand Canyon, Arizona. It is not a general summary of all available data, such as Colton provided in *The Sinagua.* While McGregor in his introductory chapter briefly reviews the known data pertaining to the Cohonina prior to this joint expedition in 1949, and lists what he considers to have been the major problems requiring attention at that time, his treatment in the text does not support the scope which the title implies. Very little information from other Cohonina sites is considered.

The first five chapters are devoted to background information, primarily restricted to the 1949 area and sites, and include discussions on environment, dates, culture, and methods of excavation. The next six sections, written by various student excavators, comprise the bulk of the report and deal with the descriptions and tabulations of the material finds. Elaine Bluhm goes into considerable detail to demonstrate the seriation of the various pottery types and wares in her chapter on ceramics, and Jeremiah F. Epstein and Douglas W. Schwartz, coauthors of the section on structures, present a well organized and illustrated discussion of the rather loose Cohonina architectural tradition. William E. Taylor, in his section on ground and polished stone artifacts, offers interesting evidence indicating that the usual designations of scoop and trough metates, when referring to Cohonina artifacts of this type, are purely relative, as the metates recovered exhibit all stages of wear intergrading between the two extreme types. The other three chapters—Ceramic Artifacts by Donald R. Downey; Chipped Stone Artifacts by William N. Walter; and Faunal and Vegetal Remains by William R. Adams—treat small quantities of material, but are adequately presented.

In the final three sections of the text McGregor presents the summary, various hypotheses, and conclusions. In the hypotheses discussed, the occurrence of pure stone sites is offered as being suggestive of a preceramic beginning, yet in another instance McGregor points to the exposure of quantities of stone artifacts on the surface as possibly being indicative of erosion. In view of the hypothesis also presented that the Cohonina apparently only occupied their sites seasonally, it appears that the non-ceramic sites, containing stone objects *similar* to those in the ceramic sites, might more likely represent campsites, a possibility McGregor mentions but does not stress.

In summarizing the ceramic tradition McGregor refers to the similarities between Cohonina pottery and that of the Kayenta branch of the Anasazi and suggests that the former derived their ceramic ideas through contact with the latter. He further states both groups made use of the coil-scrape technique, which is not completely the case. The Cohonina made use of the coil-paddle and anvil and some scraping, and in addition their ceramics also appear to bear some relation to Rio de Flag Brown, a Sinagua type.

In the conclusions, the broad traditions of the Cohonina, Anasazi, and Sinagua (which McGregor assigns to the Mogollon without explanation) are presented in an attempt to demonstrate the distinctions between these groups. Some of the traditions listed developed or were received from other groups late, rather than being basic or early, in the span of time considered (750-1100 A.D.). A further check reveals that several early Cohonina traits are similar to those of either the Anasazi or Sinagua of comparable age, but that in the course of time the divergence between all groups becomes greater.

"Based on the analysis of the evidence recovered, McGregor has set up two new foci, Naylier and Cataract. Either he overlooked the fact that Colton had previously established two foci for these same periods and areas or he failed to point out characteristics that set his foci apart from those of Colton. (Prehistoric Culture Units and their Relationships in Northern Arizona. Bulletin 17, Museum of Northern Arizona, October, 1939)."

The data recovered and major conclusions derived from these excavations in most instances duplicate the finds of the Museum of Northern Arizona (Hargrave, L. L., "Results of a Study of the Cohonina Branch of the Patayan Culture in 1938." *Museum Notes,* Museum of Northern Arizona, December 1938), some eight miles north of Williams. However, a greater diversity of material and of house types were uncovered, and this well illustrated and nicely organized report presents for the first time a detailed description of Cohonina material.

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*Report of the investigation of the Swanson Site 39BR16. Brule County, South Dakota.* WESLEY R. HURT, JR. The State Archaeological Commission, Archaeological Studies Circular No. 3, Pierre, South Dakota, 1951. 106 pp., 19 figs., 5 pls.

This report on the Swanson site represents the combined efforts of the South Dakota Archaeological Commission, the W. H. Over Museum, and the National Park Service, working toward a common goal of retrieving archaeological materials and information before inundation by storage waters back of the Fort Randall Dam, on the Missouri River. The site was selected, from among the many sites known through various previous surveys extending over many years, because it had never been disturbed by the plow or by relic hunters, while the surface material suggested the possibility that an undescribed culture was present. This monograph is the third report in what is expected to be an extensive series devoted to the State Archaeological Commission's continuing program of salvage ahead of River Basin developments.

The site occupies a low promontory overlooking the lower or wooded terrace of the Missouri River valley. Protected on three sides by a low bank, fortifications seem confined exclusively to the narrow neck connecting the site to the higher land to the north. Four large rectangular houses were completely excavated, and seven test trenches were run to obtain information on the fortifications, on depth of refuse at various points in the village, and on possible stratification.

Hurt has emphasized descriptive details. Appendices IV, V, and VI, dealing with pottery types, frequencies, and distribution, fill a need for more precise pottery classifications now felt by all working in the Plains area. Those of us working in the area two decades or more ago, conducting broad areal surveys, were chiefly concerned with the territorial limits of semisedentary cultures; those general categories of pottery no longer suffice for intensive studies of specific sites such as Hurt has undertaken. Hurt has set up and described a number of pottery types not heretofore appearing in the literature.

Hurt rightly, it seems to me, assigns the site to the Over focus, though he acknowledges inadequacy of data at this time for delimiting the focus. He finds the Swanson component was not equally related to all the other components of the focus. This variation between related sites, even of the same tribe, has formerly been noted by all those working in the North Dakota area. In historic times, cultural differences existed even between such closely associated Mandan village groups as those at Nutpadi and those at Fort Clark. Hurt indicates that the village was the primary social and political unit, and he points to the fact that upstream migration was by village rather than tribal groupings. Certainly this interpretation of diverse cultural village groups, borrowing selectively from each other, will explain the succession of cultural changes which occurred around the Heart River.

On page 20 Hurt writes: "We have no proof that all the foci of the Missouri Valley aspect belonged to the Mandan because the latest focus, the Heart River, was associated with the Mandans." He then summarizes the Mandan migration legends. He seems to have missed the point of my report (1948) in which I included the protohistoric and historic Hidatsa sites in the Heart River focus. Although Hurt suggests the intermediate cultural position of the Swanson site relative to the Cannonball and Huff foci, a view in which I concur, it seems premature to assume at the present time that this site represents one of a chain extending upstream to the historic Mandan villages. There is strong evidence that close cultural ties once existed between the Mandan and some of the central Siouans at an early period. Students of this downstream area ought not to rule out the possibility of a second cultural tradition leading to one of the historic Central Siouan agricultural tribes.

Hurt raises a number of questions with respect to this site's position in the Midwestern taxonomic system, and assigns the site to the Mississippian pattern, Plains phase, and Missouri Valley aspect. Since I set up the Missouri Valley aspect in 1948, while writing a report on the history of the Mandan and Hidatsa, a number of colleagues have drawn attention to the fact that many sites, particularly in South Dakota, would not fall within this aspect. This fact was recognized at the time. In an unpublished report of field work in that region, I suggested that the Slope aspect be set up to include a large number of pre-contact sites composed of circular earthlodges, general absence of fortifications (except for the later horizons), thin-walled incised pottery, strap handles, broad-tanged triangular projectile points, and finely carved flaking tools cut from buffalo scapulae. Hurt's study of the Swanson site emphasizes the need felt today for a reappraisal of the whole framework for classifying earthlodge sites in the Plains.

But time is running out in the Plains. It is to be hoped that many additional sites will be excavated and studied before they are lost by inundation. Whereas the early studies were creatively historical, employing history, native traditions, and limited surveys and excavations, the time has now come for the detailed excavations of specific sites and the testing of various theories. Today we need dozens of reports of the kind Hurt has given us. South Dakota, with its many large and concentrated sites of long occupation and the scattered Woodland sites underlying many of them, is an ideal field laboratory. The persons instrumental in setting up the State Archaeological Commission are to be commended for their efforts to salvage as much as possible of the state's archaeological resources.

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*Excavations at Kolomoki. Season I-1948.* WILLIAM H. SEARS. University of Georgia Series in Anthropology, No. 2, University of Georgia Press, Athens, Georgia, 1951. 48 pp., 1 map, 8 figs., 7 plates. $1.50.

*Excavations at Kolomoki. Season II-1950.* WILLIAM H. SEARS. University of Georgia Series in Anthropology, No. 3, University of Georgia Press, Athens, Georgia, 1951. 35 pp., 1 map, 3 figs., 14 plates, $1.50.

These two reports of excavations at the large Kolomoki mound group in southwest Georgia are commendably early publications for long-continued excavations such as these. The mound group is a State Park and combines archaeological features with public recreational elements. Sears has been in charge of the excavation and museum program for the past four years. I believe the title of the second report contains a typographical error as the excavations reported therein were actually conducted in the summer of 1949 rather than 1950. Mound D was excavated by Sears in the summers of 1950 and 1951.

The first report deals with test excavations in the village area surrounding the mounds and was undertaken to provide data on what complexes were present at the site and also to indicate where the necessary park developments could be placed. Four culture complexes were identified, namely: a Swift Creek variant; Weeden Island I; Kolomoki; and Lamar. The Swift Creek variant is a species of Late Swift Creek and seems to be on the approximate time level of the Weeden Island Component at the site. The two complexes interchange sherds and from the early excavations it was impossible to show any clear stratigraphy between them. This agrees well with other stratigraphic situations in Georgia where the early stamped complexes of Swift Creek, Napier, and Mossy Oak often interchange positions or appear in mixed deposits. There was manifestly no long dominance of any complex in the Georgia area at this time level. The Weeden Island component at Kolomoki is identified in the Season I report as Weeden Island I on the basis of the total absence of Wakulla Check Stamp, the marker for Weeden Island II. It seems highly similar to the Floridian varieties and is at present the most northern site of this complex. The Kolomoki component, as defined for the first time, is an outgrowth of Late Swift Creek and heavily influenced by Weeden Island. It is principally known from its ceramic complex of which the predominate type is Kolomoki Complicated Stamped. It differs from Late Swift Creek Complicated Stamped mainly in having unstamped rims, less complex elements (chiefly scrolls and figure-eights with bars), square or disc flat bases rather than tetrapodal bases, and the stamping is more often zoned around the shoulder area of the jars. It is, however, definitely in the Swift Creek tradition as regards execution, width of lands, etc. Kolomoki Plain is simply a plain variety like the stamped type. The only other items identified as belonging to this complex are small stemmed projectile points, flake knives and scrapers, and a few fragmentary polished celts. The Lamar component consisted of quite typical Lamar Complicated Stamped, a passable Lamar Bold Incised and Lamar Plain plus a late checkstamp (Mercier Check Stamp) which has many secondary characteristics of Lamar Complicated Stamped. This resurgence of checkstamp at the Lamar or protohistoric horizon has been noted elsewhere. The Lamar Component is confined to small, scattered middens and is definitely not a major element at the Kolomoki site.

The second report, Kolomoki Season II, begins to get into the wilder aspects of the burial complex which became really flamboyant in Mound D. This report describes the excavation of Mound E some distance west of the large temple mound that dominates the group. The mound was excavated by a modified vertical slicing technique so that the central tomb and pottery deposit were preserved as an in-place exhibit. The central pit contained the partially cremated remains of one individual together with a quantity of barrel-shaped shell beads and two disc cymbal-shaped copper ear ornaments, with fresh-water pearls in the centers. The pit had been partly filled with earth and large sandstone boulders when two additional burials were placed near the top. Higher still two single skulls had been buried in this pit along with another individual. The filling of the pit was continued to produce the primary mound. Just east of the primary mound a deposit of fragmentary vessels and one copper cymbal-shaped ear ornament had been placed. The secondary mantle was then added with the main pottery deposit placed on its east side. This deposit contained 54 whole or reconstructable vessels as well as many fragments. Sears' excavation of these vessels, almost inextricably fixed in a hard matrix of south Georgia clay liberally laced with tree roots, was a fine example of his excellent field technique. Finally, the whole mound was covered with a last mantle. All mound elements contained numerous large sandstone boulders. These were both scattered and grouped in lines around the central pit and the peripheries of the several stages.

Upon the main deposit depends Sears' identification of the Kolomoki complex as an outgrowth of Weeden Island. It contained equal numbers (11 each) of Weeden Island Plain, Kolomoki Complicated Stamp, and Mercier Red on Buff (a new type). Additional vessels were 7 Weeden Island Incised, 4 unclassifiable stamped, and 8 jars which seem to combine elements of Kolomoki and Weeden Island. Two vessels are unaccounted for in the summaries. Mercier Red on Buff is a free-hand red paint on a buff ware that combines Floridian elements (Weeden Island) with Middle Mississippian traits such as vessel shapes of jars and bowls, and even such detailed items as the added notched lip-band of the Dallas focus. Sears properly indicates the mature (late) Mississippian affiliation of this type. He also comments on the evidence for a late date of the cursive designs in Weeden Island as contrasted with the zoned incision which he believes to be early. The

smaller pottery deposit, and the miscellaneous sherds in both groups, contained the same types as the large deposit, but in varying proportions.

In the concluding section Sears draws on the information contained in Mound E to draw some apparently valid conclusions about the burial practices of the community. He points out that the sub-mound pit evidently contained the remains of a priest-chief and that the higher burials were those of slaughtered retainers as Du Pratz reported for the Natchez. The isolated skulls he thinks were trophy skulls. The pottery deposit is a typical Weeden Island trait and Sears concludes that some of the burial mounds excavated by Clarence B. Moore in Florida may well also have contained sub-mound burial pits. Unfortunately Moore's field and report techniques make this uncertain. From the association of Weeden Island and Kolomoki pottery types in all the mound pottery deposits he concludes that the burial mound belongs to the Kolomoki complex which is in turn descended from the Weeden Island complex. The Weeden Island pottery types present in the burial mound would thus be regarded as the archaic hold-overs reserved, and made, solely for funerary use after they had gone out as domestic types. This is certainly one explanation of the occurrences noted. Would not a caste system, such as indicated by important central burial with the sacrifice of retainers at the graveside, also explain the facts? In that case each caste would have its favorite or traditional pottery types and each would have contributed according to its means and ceramic tradition to the pottery deposits. In view of the long tradition of complicated stamping in Georgia we could see the Kolomoki Complicated Stamp as the result of local groups and the Weeden Island types as introduced by a priest-chief caste of new arrivals. Goggin, at least, believes Weeden Island extends up to late Middle Mississippi or early Temple Mound II times, where Sears places the Kolomoki complex. Thus the times would be approximately right for such a situation. We may suppose that the further excavations planned will clear up some of these problems.

Sears goes on to discuss his own and the Willey-Goggin views of Weeden Island. Briefly, Willey and Goggin hold that the Kolomoki Weeden Island is Weeden Island I because Wakulla Check Stamp or a comparable type is absent. Sears holds that the absence of Wakulla Check Stamp does not of necessity mean that his Weeden Island component is early. He cites the presence of the zoned variety of Weeden Island Incised in the village as an evidence of its placement in Weeden Island I but holds that the cursive, free-hand incising in the burial mound indicates a Weeden Island II time for that component and thus for the associated Kolomoki complex. He adds the undoubted mature Middle Mississippian elements on Mercier Red on Buff as a clincher. Willey and Goggin in a number of publications have presented the evidence that Wakulla Check Stamp is the marker for Weeden Island II in the northwest Florida area. It would take more evidence than here presented to invalidate their assertions. However, it does seem that Sears marshals both significant facts and valid assumptions to bolster his revision. I would be the last to claim that a specific pottery type will always occur with another series at a given time level over a wide area. It is perfectly possible for a number of sites to differ in one or more elements of the complex and yet be clearly associated with those sites having the majority of traits. In brief, "diagnostic traits" are not infallible. In that case it would seem that the Kolomoki Weeden Island material, in the Mound E component at least, can still be Weeden Island II and yet lack Wakulla Check Stamp. It remains to be seen if a further analysis of the entire Florida and Georgia Weeden Island material will still retain Wakulla Check Stamp as a valuable time marker. Of course, it could be such a marker for Florida and not for the southwest Georgia area away from tidewater.

Sears has speedily and competently reported on the work done on what promises to be a rather lengthy excavation of a truly large site. Those of us who have unpublished manuscripts of years, and often decades, standing can only applaud Sears, the Georgia State Parks and the University of Georgia Press. These two reports, published by the offset process, indicate what results can be expected from limited budgets. The illustrations are, in general, quite adequate and do give some of the intangibles of pottery types. The promised final and summarizing report should add much to the knowledge of that zone of southern Georgia which is unknown even to specialists in the southeast. The work of the 1950 and 1951 seasons was truly spectacular and very adequately handled.

It is never pleasant to criticize a work which sets such a good example, especially when the criticisms are admittedly rather trivial. First I cannot approve of the pottery types Mercier Check Stamp and Mercier Red on Buff under those names. They are undoubtedly valid types but the nomenclature is unfortunate. Mercier Check Stamp belongs to the Lamar component and Mercier Red on Buff to the Kolomoki component. There may be a traditional value to naming family retainers and sherd types after the "folks" of the plantation but this seems to be carrying it a bit too far. The student who must not only learn two pottery names with the same first element but in addition learn that they are not even in the same complex is indeed in a sorry fix. Better we follow the natural scientists and name new types after their discoverers and their friends. Though I must confess it is perhaps less confusing than my own Walnut Roughened, which was named for a creek rather than the instrument of decoration. Finally I was somewhat confused by the absence of scales and captions in the illustrations. In Season I, Plate VI, two projectile point groups are numbered but not identified in text or caption. In Season II the black areas in Plate I illustrating Mercier Red on Buff designs are identified as cut-outs only after a rather aggravating comparison with the illustrations of the pots themselves. In offset publication it would seem a simple matter to

add captions to the plates before photography. On the whole there are few typographical errors, and I suspect the above omissions are budgetary rather than the result of oversights. At any rate we look forward to more reports on the Kolomoki site in the same style and by the same author.

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*Excavations at Hells Midden Dinosaur National Monument.* ROBERT H. LISTER. *University of Colorado Studies, Series in Anthropology, No. 3,* Boulder, Colorado, September, 1951. 49 pp., 5 plates, 32 figs. $1.00.

This small publication is the third in the *Series in Anthropology* published by the University of Colorado, and is the second publication to deal with the little-known archaeology of northwestern Colorado. In content, the report is a continuation of the archaeological investigations first reported by Burgh and Scoggin (*The Archaeology of Castle Park Dinosaur National Monument,* University of Colorado Studies, Series in Anthropology, No. 2, Boulder, Colorado, 1948).

Hells Midden was first tested by Scoggin in 1940 and then was tested further by Burgh in 1947. The importance of the midden was established at that time, and more thorough testing was done during the summers of 1948-1949. A trench was cut completely through the midden, which had formed under and in front of the overhanging rock shelter; the trench extended from the wall of the overhanging rock, through the midden crest, and to its outer limits. The trench was 2 meters in width and extended to a depth of 5.3 meters at its crest, at which depth sterile sand was encountered.

The most important contribution of this research as described in the report is the substantiation of the presence of a hunting-gathering stage which preceded the Fremont River culture in this area of Colorado. The extension of the Fremont River culture into northwestern Colorado was first reported by Burgh and Scoggin. Also, the existence of a hunting stage preceding the introduction of horticulture was indicated by their preliminary tests in Hells Midden. It was not, however, until the summers of 1948-49 that the existence of this hunting stage was fully substantiated.

In the midden, four different archaeological cultural levels were recognized. The top-most level is excluded, however, because the material recovered from this level is recent and is assignable to a trapper and refugee from the Confederate navy, who is known to have utilized the cave around 1880. The uppermost archaeological levels of the midden (levels 2 and 3) contains material which is similar and assignable to the Fremont River culture material first described by Morss (*The Ancient Culture of The Fremont River in Utah,* Papers of the Peabody Museum of American Archaeology and Ethnology, Vol. 12, No. 3, Cambridge, 1931). The lower levels (levels 4 through 10) belong to what Lister has termed a "hunting-gathering stage" which precedes the Fremont material. This hunting-gathering stage has been further divided into three stages based on typological differences in projectile points.

It is unfortunate that the midden did not yield any perishable material with which dating of the midden could be made save for six small fragments of twilled cloth. The cloth fragments came from the upper levels of the midden which belong to the Fremont stage and consequently are of no aid in determining the age of the older levels in the midden. The date of 1500 B.C. has been suggested by Lister for the beginning of the earliest cultural level in the midden. This is only a suggestion based on the estimated time necessary for the accumulation of the cultural fill and, Lister cautions us, should not be taken seriously in any sense.

According to the report, occupation of the midden appears to have been intermittent. However, the continuity of the group which occupied the area over a long period of time is indicated by the continuation of various artifact types through the several cultural levels. The excavations of the midden further substantiates Burgh and Scoggin (p. 77) in their suggestion of the enrichment of a hunting-gathering culture with horticulture, pottery, and other such traits which represent and which are characteristic of the Fremont River culture. There is no indication of a change of people or cultures in the midden when the traits of the Fremont area first appear.

This report, together with that of Burgh and Scoggin, has helped to extend the known range of the variant Basketmaker-Pueblo culture first reported by Morss as being found along the Fremont River, Utah. However, in this connection it should be pointed out that the sites in Dinosaur National Monument are not the only known and recorded sites outside of the Fremont area that show affinities to the Fremont River culture. Wheeler (Wheeler, S. M., *Archaeology of Etna Cave, Lincoln County, Nevada,* Nevada State Park Commission, Carson City, 1942) found a cave site south of Caliente, Nevada, which in its upper levels yielded cultural material characteristic of the Fremont area. The finding of Fremont material in northwestern Colorado and east-central Nevada seems to indicate that the Fremont River culture has a wider distribution than is generally recognized. However, before any conclusions concerning the areal distribution of this modified, or variant, form of Basketmaker-Pueblo culture can be drawn, considerably more archaeological work must be done in the surrounding areas.

For those interested in pottery analysis it should be pointed out that Miss Anna O. Sheppard has presented a brief technical note on the pottery recovered from Hells Midden and Marigolds Cave, which is only inferentially referred to in the report.

I feel that Mr. Lister is to be commended on his well organized and well written report and on his attempt to standardize the form of the reports dealing with the archaeology of the Dinosaur National Monument area. The uniformity of the presentation of the material, the line drawings, and the tabular presentations make quick comparisons between the two reports possible. This small publication is a worthwhile addition to the growing body of archaeological information dealing with this little-known area.

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*Petroglyphs of Central Washington*. H. THOMAS CAIN. University of Washington Press, Seattle, 1950. 57 pages, 46 figs., 33 maps, 1 table.

This modest and well printed work considers the petrographs of central Washington from the Canadian border down the Okanogan River to its junction with the Columbia, and thence to the Oregon line, including also the Methow, Wenatchee and Yakima rivers and Lake Chelan.

The study begins with a discussion of "pictographic" art, with special reference to the area in question. Following this, 40 sites are described with a figure showing the petrographs at each. Then come 32 distribution maps for the most common designs, with a brief discussion of each, after which come the author's general considerations and his conclusions. There is a site map indicating the presence of pictographs or petroglyphs, or both, and a design distribution chart.

Pictographs only are found in the northern section, and this is attributed to the lack of suitable stone for petroglyphs since there is no "radically different stylistic treatment" between the petroglyphs and pictographs in the whole area. The colors of the pictographs are red, found in 90 per cent, yellow, far less common, and black and white which are infrequent. Whether the petroglyphs are pecked, incised, or rubbed is not clear. The author uses the word carved or cut, but in his introduction reference is made to pecking stones, and many of the figures clearly seem to have been pecked.

The commonest designs include anthropomorphs, an arc with radiating lines, circles—connected, concentric, spoked and rayed, rakes, the "brothers" design, mountain sheep, mountain goats, elk, deer, and the bow and arrow. It is interesting that the last six are centered in the middle area and almost lacking in the north. Practically all the designs bear a strong resemblance to those found in Utah and Arizona.

Cain finds a complete difference in style from the art of the Northwest Coast; little similarity between the pictographs of northern Washington and northern Idaho, but greater similarity in the petroglyphs; great similarity in the style and subject matter in the petrographs of the middle Columbia and in those of the lower Columbia; and a "striking" similarity with those of Oregon. He believes that definite relationships between the Columbia area and the Great Basin, and even Basketmaker-Pueblo cultures, eventually will be established. He thinks the diffusion of Southwestern elements to the middle Columbia, via the Great Basin, is suggested by the common elements noted above, though he includes spirals which are notably lacking from his own lists. It is true that these similarities strongly suggest some relationship, but his discussion is too general for final acceptance at this time.

In all this Cain relies chiefly on the work of Irwin, Strong, Schenck, Cressman, Kreiger and Steward. In view of the deserved attention which he gives to these relationships, it is to be regretted that Cain himself did not undertake a more penetrating comparative study, though it may be doubted, nevertheless, if this would go so far as to corroborate his belief "that a comprehensive study based on recent data would undoubtedly establish a basic similarity between the pictographs of western America."

The time has come when petrographs must be subjected to the same careful scrutiny that has been given to pottery.* Superficial resemblances of form are important but far from all sufficient. For such a study photographs are essential, and all of Cain's illustrations are from sketches, partly because of the difficulties of photography and partly, it is fair to add, because of war-time shortage of film. Also, he did not hesitate to chalk the designs. In both instances, the author's interpretation is placed between the student and the data. Sketches may supplement photographs but nothing takes their place as primary records, and as to chalking it is only necessary, to quote Cain's own observation, that "many figures have been chalked and even painted so many times in the past that it is sometimes uncertain what is the original design."

Photographing petrographs is a difficult matter, but it yields to technical skill in the choice of camera, film, lense, aperture, time and lighting. Skill and experience also are required in the reading of the prints, much as in the case of X-ray negatives, but the trained eye will often find in the photographic print what it did not decipher on the original rock. The prohibitive cost of reproducing photographs is recognized, but the line drawings should always be supplemented by one or more half-tone or gravure plates, so that the reader can form his own judgment of the style and general character of the petrographs.

Cain omits the word petrographs from his title because of the geologists' use of the same word for a different study. He then defends its use in the body of his work but frequently substitutes "pictographic art" for the inclusive term, as in the introduction and on pages 34, 42 and 48. This leads to uncertainty elsewhere as to whether petroglyphs are included or not when the term pictograph is used.

* Cf., for a recent systematic analysis, David S. Gebhard, "The petroglyphs of Wyoming: a preliminary paper," *El Palacio* 58:67-81 (No. 3, March), 1951, Museum of New Mexico, Santa Fe. (Assoc. Ed.).

The drawings are very clear, probably more so than the originals, since chalking was often used; but they have been reduced to a point where it is not always possible to distinguish between cross-hatching and oblique lines, and the scale of each design should have been given in legends beneath the figures. There are numerous inconsistencies between the site map and the distribution chart.

In general, Cain shows himself a careful and cautious investigator, his monograph contains much information, and he has performed a valuable service for all archaeologists in his painstaking preservation of these records before many of them are obliterated under the present plans of the Columbia River Valley Authority. He pays a deserved tribute to Harold Cundy and the Columbia River Valley Archaeological Society for their foresight and early work in this direction.

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# BOOK NOTICES

A general work of the greatest importance, value, and interest has been issued as a pocket-sized paper-covered "Mentor Book" in a special revised and abridged edition: GEORGE GAYLORD SIMPSON, *The Meaning of Evolution*, New American Library, 501 Madison Avenue, New York 22, October, 1951, 35 cents (192 pp., 22 text figures). In this version, nine chapters on facts and evidence and detailed reconstruction of the palaeontological record are condensed into one; the broader philosophical discussions of interpretation and significance, extending into ethics and the future, are essentially unabridged. The original edition (*The Meaning of Evolution: A Study of the History of Life and of its Significance for Man*, Yale University Press, New Haven, 1949), was an expansion of the twenty-fifth series of Terry lectures, delivered at Yale by Dr. Simpson.

The detailed history of the development of animal life on this planet, with little special reference to human history, is presented in the recently issued culminating work of Dr. WILLIAM K. GREGORY, *Evolution Emerging*, Macmillan, New York, April 1951; Vol. I (text), 736 pp., Vol. II (illustrations), 1013 pp., 12 half-tone plates, over 900 line drawings; boxed set $20.00.

Not previously noted in this department is the particularly valuable and useful (even though the Primates are unduly slighted) general book on structure and evolution by ALFRED S. ROMER, *The Vertebrate Body*, Saunders, Philadelphia, 1949 (viii + 643 pp., 363 figs., $6.00; reviewed by S. L. Washburn in the *American Anthropologist* 52-3, pp. 409-10, July-Sept. 1950, and by Alice G. James in AJPA 8-1, March 1950, pp. 124-126.

Directly pertinent to archaeology is the revised second edition of the important and fascinating study, devoted in large part to the Pleistocene and human history, by FREDERICK E. ZEUNER, *Dating the Past, an Introduction to Geodendrochronology*, Methuen, London, 1950 (xvii + 474 pp., 23 plates. 30/—). Developments through 1949, including a summary on radiocarbon, have been incorporated or appended.

*Franciscan Awatovi: The excavation and conjectural reconstruction of a 17th-century Spanish Mission establishment at a Hopi town in northeastern Arizona.* ROSS GORDON MONTGOMERY, WATSON SMITH, AND JOHN OTIS BREW, with an appendix by Father J. FRANKLIN EWING, S. J. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, Vol. XXXVI, 1949. Pp. xxiv + 361, pls. 18 (1 in color), figs. 45. $5.85 paper, $8.35 cloth.

A model of presentation and interpretation of historical archaeological work; a magnificent job of thorough coverage of all aspects of the investigation and study of San Bernardo de Aguatubi (1629-1680 and *ca.* 1700): documentary history, excavation findings—three churches, a friary, a secular building, wall and gateway, a Hopi kiva covered by the main altar of the mission church, burials, religious medals; conjectural restoration by Montgomery—not just the architecture, but restoration of the life and activity of the mission; and—by Smith—mural ornament.

Reviewed by George Kubler in the *American Anthropologist*, Vol. 53, No. 1, Jan.-March, 1951; by Erik K. Reed in the *American Journal of Archaeology*, Vol. 55, No. 3, July 1951; by Marjorie F. Tichy Lambert in *El Palacio*, Vol. 57, No. 9, September 1950. See also papers by J. O. BREW, "The first two seasons at Awatovi," *American Antiquity*, Vol. 3, No. 2, pp. 122-137, October 1937; "Awatovi expedition of 1939," *Plateau*, Vol. 13, No. 3, January 1941; and "Peabody Museum excavations in Arizona," *Harvard Alumni Bulletin*, Vol. 41, No. 27, pp. 870-5, Cambridge, 1939.

*The Mission of San Gregorio de Abo: A Report on the Excavation and Repair of a Seventeenth-Century New Mexico Mission.* JOSEPH H. TOULOUSE, JR. Monograph of the School of American Research No. 13. The University of New Mexico, Albuquerque, 1949. Pp. 36, pls. 42, figs. 34, $3.00.

A more concise monograph, a technical excavation report from the approach of the Southwestern archaeologist, which takes on added meaning if read along with *Franciscan Awatovi*. The work of Mr. Toulouse alone, with little aid from specialists, except for a quite inter-

esting appendix by Volney H. Jones on organic remains, particularly the introduced crop plants (peach, melons, grape, chili pepper, coriander).

Reviewed by Erik K. Reed in the *American Journal of Archaeology*, Vol. 55, No. 3, July 1951, and in NMHR XXV-2, April 1950; by J. O. Brew and Ross Montgomery in *El Palacio* 58-10, October 1951.

*Tumacacori's Yesterdays.* EARL JACKSON. Southwestern Monuments Association Popular Series No. 6, Santa Fe, New Mex., 1951. Pp. 96, photogr., ills. and drawings. $0.75.

A well-written popular sketch of the history of San José de Tumacacori, frontier outpost of the Sonora mission chain of the 18th century and first half of the 19th, now a National Monument of which Mr. Jackson, an archaeologist turned administrator, is Superintendent. Largely concerned with history of church construction and mission operations, this little book also bears on the Mission Indians and Papago acculturation.

*The papers of Sir William Johnson, Volume X*, prepared for publication by MILTON W. HAMILTON and ALBERT B. COREY. The University of State of New York, Albany, 1951. Pp. xiv + 998, 12 plates.

The historical documents collected in this volume from various sources in Canada, London, and the United States, cover the period September 1758 through December 1763 and largely deal with the campaigns of the French and Indian War, Pontiac's Conspiracy, and related matters concerning the native Indians as well as Europeans in western New York and neighboring areas, Sir William Johnson, Bart., having been His Majesty's Agent and Superintendent for Indian Affairs.

Of interest and value to students of Iroquois history are such items as lists of trade goods and presents, and lists of Indians of the several Iroquois tribes in groups or individually by name, notably those to whom silver medals were given; there are proceedings of conferences held in Detroit in December 1760 between English representatives (Capt. Donald Campbell, Governor of Detroit; George Croghan, Esq., Deputy Agent to Sir William Johnson; and Major Robert Rogers, of Ranger fame) and the chiefs of the Wyandots, Ottawas, Pottawatomies, and other councils; there is a great deal of material on the Indian uprising of 1763. No index is included, nor detailed table of contents listing the documents; notes are minimal, restricted largely to giving full names.

Incidental anecdotes of interest are many—Croghan to Johnson, Fort Pitt, Sept. 6, 1760: "Hond. Sir, Inclosd. I Send you a Copey of ye. Late Conferance Held Hear with a Number of ye. Westren Nations for yr. perruseal . . . they behaved well & kept Very Sober nott withstanding ye. Greatt Temtations they had from the greatt quantitys of Liquer hear after ye. business was over and they had Received thire present ye. Gineral was Ginerous Anouff to order them a sufficent quantity of Rum to Make ye. whole Drunk fer some Days and while they were Drunk they behavd. with so Much Sivelety to Every person as sufficent to Convence Me they were Sinceer in all thire promises"—in a record of a conference with the Miamis and others, Sept. 25 to Oct. 3, 1761: "David Lutts Soldier in the Royal Americans killed a very fine Indian horse by throwing his Bayonet at him, the horse belonged to the Oataawas, it made a great Disturbance . . . with a great deal of trouble I made it up with giving them a Gallon of Rum 2 English Blankets 2 lb Powder and 4 lb Ball & was likewise obliged to promise them the first horse I could get & I gave Lutts 100 Lashes for Disobedience of orders."—Maj. Gen'l. Jeffrey Amherst to Sir William Johnson, July 28, 1763: "I would on no Account whatever think of Engaging of the Stockbridge Indians: I know them to be a Worthless Tribe; and I really canot Say, I Approve of Employing any of the Canadian Indians. All I ask them is to Remain Quiet."

*Old Birch Island and the Early Historic Trade Route, Georgian Bay, Ontario.* EMERSON F. GREENMAN. Occasional Contributions from the Museum of Anthropology of the University of Michigan, No. 11, 1951, 69 pages, 26 plates, 4 maps, 7 figures. $2.00.

This is primarily a site report of work done during the summer of 1938 by the Museum of Anthropology, University of Michigan. It is introduced with a short discussion of that part of an early historic trade route which passed through the Manitoulin District of the Great Lakes. The French and the Indians are known to have used this route between Montreal and Sault Ste. Marie during the interval 1608-1760.

Old Birch Island lies near the probable route and contains a small Indian cemetery of the historic period. This cemetery contained 16 individuals in 12 graves. There were 2 cremations, 3 bundle burials and 11 flexed burials. Greenman carefully describes each grave and the artifacts of native and trade material, which were encountered in each. In his interpretation he suggests that these represent an evolved Point Peninsula culture which persisted into the historic period in this region.

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*Stone Age Craftsmen: Stone Tools and Camping Places of the Australian Aborigines.* S. R. MITCHELL. Tait Book Co., Pty. Ltd., Melbourne (American representative—Stechert-Hafner, Inc., New York), 1949. Pp. 211, 16 pls. and 45 figs. 27/6.

Noted in the *American Anthropologist* (Vol. 53, No. 1, Jan.-March 1951, pp. 123-124) by Joseph R. Birdsell, who says it deserves to be widely read by archaeologists interested in culture at the hunting and collecting level, this evidently is even more pertinent and valuable for students of people as well as of artifacts than the paper on Stone Age technology in modern New Guinea noticed in the January 1952 issue of *American Antiquity*.

*Notes on the Prehistoric Metallurgy of Copper and Bronze in the Old World.* H. H. COGHLAN. Occasional Papers on Technology 4, Pitt Rivers Museum, Oxford University, 1951. Pp. 131, 16 plates, 21 text figures. 15/—.

A clearly written review of copper and bronze techniques, concerned with Europe and the Near East, but nevertheless particularly useful to read as a preliminary to technical Americanist studies such as Paul Bergsoe's paper on *The Gilding Process and the Metallurgy of Copper and Lead among the Pre-Columbian Indians* (Ingeniorvidenskabelige Skrifter A-46, Danmarks Natur videnskabelige Samfund, Copenhagen 1938) or the important and comprehensive book by P. Rivet and H. Arsandaux, *La métallurgie en Amérique pré-Colombienne* (University of Paris, 1946, reviewed by S. K. Lothrop in the *American Anthropologist*, Vol. 50, No. 1, Jan.-Mar. 1948, pp. 101-2).

*Origin and Evolution of Man.* Cold Spring Harbor Symposia on Quantitative Biology, Vol. XV. Edited by Dr. KATHERINE B. WARREN. The Biological Laboratory (Long Island Biological Association), Cold Spring Harbor, L. I., New York, 1950. xii + 425 pp., line drawings, maps, 4 photographic plates. $7.25.

Thirty-seven papers by geneticists, paleontologists, and anthropologists, presented at the symposium held at the Long Island Biological Laboratory in June, 1950, are grouped under nine headings, three papers each with two exceptions, plus concluding remarks by the chairman of each session; edited discussions are included, and an index has been added. The entire publication is of the greatest interest and value to students of the history of mankind.

The first group of three papers is headed "Population as a unit of study" and is devoted to the fundamental subjects of "The genetics of human populations" (by H. H. Strandskov) and the evolution of man, and "Problems and methods of population surveys" (by F. P. Thieme), with the biologist Marston Bates (best known generally for his recent fine book, *The Nature of Natural History*), as chairman of this first session, contributing valuable concluding remarks. The paper by A. Buzzati-Traverso is entitled "Genetic structure of natural populations and interbreeding units in the human species."

All the six papers on "Origin of the human stock" (W. W. Howells, chairman) and "Classification of fossil men" (W. M. Krogman, chairman) are of special interest for archaeologists, though not directly affecting specific problems of New World history. These are: A. H. Schultz, "The specializations of man and his place among the catarrhine primates"; G. G. Simpson, "Some principles of historical biology bearing on human origins"; S. L. Washburn, "The analysis of primate evolution with particular reference to the origin of man"; T. D. McCown, "The genus Palaeoanthropus and the problem of superspecific differentiation among the Hominidae"; T. D. Stewart, "The problem of the earliest claimed representatives of Homo sapiens"; Ernst Mayr, "Taxonomic categories in fossil hominids." Striking points include the surprising idea of considering all of the South African man-apes as representing a single fully human species, *Homo transvaalensis* (Mayr, Krogman); the suggestion that the Neanderthalers, who generally have constituted a fixed point in a changing world, were a local and variable race of *H. sapiens* (McCown, Stewart, Mayr); and a general tendency, well summarized by Howells and by Krogman, toward grouping all fossil hominids more closely together than heretofore in a single broad synthesis.

Among the nine papers in three groups on "Genetic analysis of racial traits" (chairmen, Laurence H. Snyder, Sheldon C. Reed, Clarence P. Oliver), three are on subjects drawn from or including American Indian data—W. S. Laughlin, "Blood groups, morphology and population size of the Eskimos" (*cf.* the review by T. D. Stewart in *American Antiquity*, Vol. 17, No. 4, 1952, and by myself in the current issue of the *American Journal of Archaeology*, of the Viking Fund volume *Papers on the Physical Anthropology of the American Indian*); James N. Spuhler (now located at the Pentagon, we hear with trepidation and heartfelt sympathy), "Genetics of three normal morphological variations: patterns of superficial veins of the anterior thorax, peroneus tertius muscle, and number of vallate papillae" (based on data from the Ramah Navahos); Gabriel W. Lasker, "Genetic analysis of racial traits of the teeth" (including, *i.e.*, supernumerary molar cusps, shovel-shaped incisors, palatine torus, all of which have been noted and studied among North American Indians). In addition, the various blood-type factors are summarized by R. R. Race, "The blood group systems and their inheritance." Discussions and concluding remarks of chairmen emphasize the genetic approach to the history of human populations and the difficult problems of handling such studies.

Five papers under "Race concept and human races" (L. C. Dunn, chairman) are all of special interest and general pertinence for archaeologists, though none is devoted to Americanist subjects. The first, by C. S. Coon, is general and basic, and is virtually summarized in its title, "Human races in relation to environment and culture, with special reference to the influence of culture upon genetic changes in human populations." Coon refers particularly to demographic and historical factors, such as culturally regulated selection of mates, differential longevity and infant mortality, factors affecting fertility.

The next paper, by J. B. Birdsell, "Some implications of the genetical concept of race in terms of spatial analysis," presents and interprets trait distributions among Australian natives, exemplifying concepts such as "genetic drift"—random change by nonadaptive (?) chance survival or disappearance of traits (*i. e.*, genes) in small breeding populations; gene flow—the spread of new traits through intermixture; genetic isolates (an isolate being a more or less closed group, a breeding

population set apart by cultural or geographic factors) and genetic space and distance (as against mere geographical extent). Birdsell discusses aspects of the population history of Australia and reaches the conclusion that positive selection has been the responsible evolutionary factor, rather than mutation, "random genetic drift," or hybridization. The discussion following his paper is largely concerned with the concept of "genetic drift," Arthur J. Cain and Theodosius Dobzhansky doubting the occurrence of purely nonadaptive random selection, and E. E. Hunt, Jr., making the very good point that in man the effect could be produced by cultural factors (such as Coon treated).

In the third paper of this group, "A consideration of the concept of race," Ashley Montagu is concerned with mistaken notions of race and the zoological meaning and with his recommendation made previously (1941, 1945, etc.), following J. S. Huxley and A. C. Haddon (1935), of use of the term "ethnic group"; then Part II, The Mechanism of Race Formation, is taken from his *Introduction to Physical Anthropology*.[1] The discussion deals with the idea of speaking — and thinking—of "ethnic groups" in order to combat racism.[2] Next, in "Anthropological maps of the Nordic countries," Bertil Lundman of Uppsala presents trait distributions in Scandinavia; finally, J. Lawrence Angel, in an exceptionally interesting study, "Population size and micro-evolution in Greece," concludes that skeletal data from ancient Greece fit the hypothesis of Dobzhansky, Wright, and Huxley and suggest that changes in size of breeding units plus genetic recombinations probably operated as determining factors. The summation by Dunn points out that a reasonable concept of race should be a working hypothesis of what has actually happened.

The three papers on "Constitution," with E. A. Hooton as chairman, vary in approach. Stanley M. Garn, in "The constitutional modification of Mendelian traits in man," considers the role of physique in selection, and specifically certain correlations between somatotype (body build) and coronary disease. Carl C. Seltzer's "Constitutional aspects of juvenile delinquency" is a further discussion stemming from his Appendix C, "A comparative study of the morphological characteristics of delinquents and nondelinquents" in Sheldon and Eleanor Glueck's *Unraveling Juvenile Delinquency* (Commonwealth Fund, New York, 1950, reviewed by S. L. Washburn in the *American Anthropologist* 53:4, October-December 1951, pp. 572-574), emphasizing that delinquents are not physically inferior but are morphologically normal, most often mesomorphic and high in somatotonia. The paper by the leading somatotyper, W. H. Sheldon, "The somatotype, the morphophenotype, and the morphogenotype," is—despite its title—far the most readable and interesting, though slightly confusing. He seems also to have pointed out that males and females differ. The discussions in this section are the sharpest in the book (*cf.* the rather devastating reviews of W. H. Sheldon *et al.*, *Variations of Delinquent Youth, an Introduction to Constitutional Psychiatry*, Harper and Bros., New York, 1949, xvii + 899 pp., $8.00, by Stanley M. Garn in AJPA 8-1, March 1950, pp. 130-133, and by S. L. Washburn in *American Anthropologist* 53-4, October-December 1951, pp. 561-563[3]).

Most significant is the final section on "Perspectives of future research." Dobzhansky's paper on "Human diversity and adaptation" is an extremely helpful and informative, balanced, and lucid treatment of human variability, and the explanations therefor, and the importance of cultural factors. Clyde Kluckhohn and Charles Griffith, "Population genetics and social anthropology," discuss possible areas of collaboration between social and physical anthropologists, with interesting examples (including Ramah Navaho history and mating systems). The "Concluding remarks of the chairman," by Dr. Curt Stern, review the entire meeting, papers, and important discussions, with several highly pertinent comments of his own.

Finally, discussion by Dr. Earl V. Count brings out the great importance of research on (1) ontogenetic growth in relation to evolution—at what point in an individual life-cycle can mutation occur, and what is the rate of change and of the evolution in rate of growth; (2) constitution, in a broader meaning than somatotyping, specifically, relationship between constitutional type and race; and (3) social biology—culture as artificial ecology having selective value.

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[1] Published by C. C. Thomas, Springfield, Ill., 1946; reviewed by L. C. Eiseley in the *American Anthropologist*, 48:647, No. 4, October-December 1946, and by T. D. McCown in the *American Journal of Physical Anthropology* 5:379-384, No. 3, September 1947.

[2] *Cf.* reviews of M. F. Ashley Montagu, *Statement on Race* (Schuman, New York, 1951, xi + 172 pp., $2.00) by G. W. Lasker in *American Anthropologist* 53:563-564, No. 3, October-December, 1951, and by Robert Ehrich in AJPA 9:375-378, No. 3, September, 1951.

[3] But *cf.* also a recent paper giving real meaning and use to somatotyping—Bertram S. Kraus, "Male somatotypes among the Japanese of northern Honshu," AJPA 9:347-366, No. 3, September, 1951.

# NOTES AND NEWS

## GENERAL

In addition to national meetings, such as that of the Society at Columbus, May 1-3, regional conferences are continuing to develop and gain in importance. Five such gatherings are mentioned or reported in this issue: the Northwest Conference, Seattle, May 2-3; the Ninth Plains Conference, Lincoln, April 11-12; the Caddoan Workshop, Norman, April 22-23; the Southeastern Conference, to be at Macon, Oct. 31-Nov. 1; the 1952 Pecos Conference (Southwest), to be at Santa Fe, August 11-13. These have become more productive and better attended than Division meetings of the A.A.A.S., or many of the larger or national conventions. Newsletters are issued by the Plains and Southeastern conferences, in addition to those of the American Anthropological Association and the Western States branch thereof, and the particularly valuable newsletter of the Clearing House for Southwestern Museums (Denver Art Museum, 1300 Logan St., Denver). That of the American Association of Physical Anthropologists (Bertram S. Kraus, editor, University of Arizona) is, of course, specialized and overlaps only slightly with the various others. Important fairly recent additions among local series are the "Archeological Newsletter" of the Upper Ohio Valley Archeological Survey, (Carnegie Museum, Pittsburgh, W. J. Mayer-Oakes, editor—No. 4 issued October, 1951), and the *West Virginia Archeologist*, (published by the West Virginia Archeological Society, Delf Norona, editor, Moundsville—No. 4 dated June, 1951).

Field work in many areas continues to be stimulated in large part by reservoir construction and other threats; the government archaeological salvage (River Basin) program has greatly accelerated excavations in the whole country (just as the Archaeological Survey of Nubia, for example, was reestablished, by the Egyptian government, only in 1929 when the raising of the Aswan dam threatened inundation of much of Lower Nubia by the Nile). Another factor bringing about concentrated investigation, archaeological as well as historical, is the series of land claims by Indian tribes, currently ranging from the Pimas in southern Arizona (on which Paul Ezell is working) to the Coeur d'Alene, Nez Perce, and others in the Northwest Interior (Alfred M. Bowers).

In the field of interpretation and education, the outstanding new development is the University of Utah television class, "your TV introduction to anthropology," entitled "People: how they act," presented by our fearless editor, Jess Jennings, during the past winter and spring, a course which could be taken for credit through the University of Utah Extension Division. This is an idea which should be especially applicable for archaeology; Jennings is now working on another series centered on North and Central American prehistory.

Another important item in the field of education and interpretation is the new exhibit, opening June 7, 1952, on "Man in our Changing World," at the Los Angeles County Museum. Utilizing findings in archaeology and other anthropological fields to convey a message, not merely presenting curious information, this exhibit, planned by Bob Ariss and prepared by the History and Anthropology Division of the Los Angeles County Museum, is intended as a survey of the physical and cultural accomplishments and potentialities of mankind.

Of the greatest importance, not just in ethnobiology alone as such, but for the study of aboriginal culture-history in America, is the general paper given by Volney H. Jones at the Columbus meeting of the Society on "Recent developments in the history of North American Indian agriculture." The generally accepted ideas and standard concepts regarding corn and other American crops will have to be discarded or extensively revised. Interesting from the point of view of aculturation as well as ethnobotany is a paper by T. N. Campbell, "Medicinal plants used by Choctaw, Chickasaw, and Creek Indians in the early nineteenth century," *Journal of the Washington Academy of Sciences* 41:285-290, No. 9, September 1951.

## RADIOCARBON DATES

A very helpful little book by Willard F. Libby, *Radiocarbon Dating* (University of Chicago, 1952, $3.50) is concerned largely with principles and methods, but includes the list (rearranged) of dates obtained through the first half of 1951 and a chapter by Fred Johnson on the significance of the dates for archaeology and geology. This publication is to be briefly reviewed in a later issue of this journal.

The discussion at the Columbus meeting was concerned largely with reports on current and coming operations, and problems of contamination (see the comment by Wesley Bliss in the January issue of *American Antiquity*, 17-3, pp. 250-251). All discussants (physicists) referred to the special current and continuing problem of contamination by radioactive dust in the atmosphere from atomic explosions, since 1945 but now, since the Nevada tests, more serious: samples must be placed in airtight containers immediately upon collecting.

Currently active laboratories reporting on their programs included: University of Chicago (the Institute for Nuclear Studies is continuing to date certain specimens, and developing a scintillation counter of greater sensitivity, which, with other improvements in technique, may extend the range of dating back another half-life or so), University of Michigan (fully operating, at the Randall Laboratory of Physics, has produced numerous dates not yet assembled for publication), University of Pennsylvania (getting set up, at the Morgan Laboratory of Physics, will run checks, and then start dating material from Hotu, Iran, and then from Alaska), Yale University Geochronometric Laboratory (organized, being worked out, eliminating sources of local contamination, concerned particularly with problems of contamination generally and other difficulties of the method), and Columbia University (the Lamont Geological Observatory has been active in this field for a year and a half,

has run a lot of samples, is active and expanding, though interested primarily in possible geological applications—improvements in technique are expected here to extend the span to 30,000 years).

Other institutions at which radiocarbon laboratories are already operating or are proposed for installation include the University of California, the University of Colorado, and the University of Texas.

A faintly disheartening note at the Columbus radiocarbon panel was the frank statement that the cost of testing one sample, aside from any amortization of the original installation, runs between $200 and $600, and that the physics laboratories are going to have to charge accordingly for dating of archaeological materials.

No newly-obtained dates were announced at the meeting, but an important published list has not been previously mentioned here: J. L. Kulp, H. W. Feeley, and L. E. Tryon, "Lamont natural radiocarbon measurements, I," *Science* Vol. 114, No. 2970, November 30, 1951, pp. 565-568—including archaeological samples from about twenty different sites from Alaska to South America. The most interesting is the date-inscribed Maya lintel from Tikal, two samples from which averaged 1470 years ago, plus or minus 120 years—right on the nose, to the exact year, for the date 9.15.10.0.0 in the Spinden correlation, which is also confirmed for Early Classic.

## NEW MATERIALS ON DENDROCHRONOLOGY

Smiley's compilation of Southwestern tree-ring dates to date was completed in the fall and issued early in 1952: T. L. Smiley, *A Summary of Tree-Ring Dates from some Southwestern Sites*, University of Arizona Bulletin XXII, No. 4 (Laboratory of Tree-Ring Research No. 5), Tucson, covering a total of 5,612 specimens from 365 separate sites, with discussion of archaeological interpretation of tree-ring dates.

At that writing, as for several years past, the inside ring of the Southwestern tree-ring chronology was 11 A.D., and the earliest dates those between 188 A.D. and 203 A.D. from Basket Maker II sites near Durango, Colo. (A. E. Douglass, Edmund Schulman, and Earl Morris, in *Tree-Ring Bulletin* 15-4, April 1949). The calendar has now been run back to 58 B.C., and a bark date of 46 A.D. has been confirmed, by specimens from the same locality (Schulman and E. H. Morris, *Tree-Ring Bulletin* 18-4, April 1952).

In addition, a very interesting recent paper by Schulman ("Definitive dendrochronologies: a progress report," *Tree-Ring Bulletin* 18-2/3, pp. 10-18, January 1952), concerned with analysis and comparison of sequences from old living trees throughout the West, makes the important point that fluctuations in rainfall for the entire year, not merely winter precipitation alone, are recorded in the rings, at least by Douglas fir, the species used in the study—refuting the suggestion (by H. S. Gladwin, *Tree-Rings and Droughts*, Medallion Papers No. XXXVII, Gila Pueblo, Globe, Arizona, n.d.) that the concentration of narrow rings from 1276 to 1299 A.D. might not represent drought years, so far as concerns the summer rains essential to Pueblo Indian agriculture, at the time of Anasazi abandonment of most of the northern part of the Southwest.

Terah L. Smiley of the Laboratory of Tree-Ring Research, University of Arizona, plans the completion of four dating projects during the summer: (1) a study of the tree-ring material from the upper Rio Grande Valley collected by the Laboratory of Anthropology during the last twenty years, with a detailed analysis of the chronology as well as a correlation of the individual dates with the archaeological phenomena; (2) tree-ring dating of the eruption of Sunset Crater near Flagstaff, Arizona, based upon studies by the Museum of Northern Arizona and the Laboratory of Tree-Ring Research; (3) an analysis of the tree-ring specimens collected by the Peabody Museum in the vicinity of Quemado, New Mexico; and (4) the study of the material from Kin-Kletso, Bc-51 and Bc-59 at Chaco Canyon, New Mexico, collected in the summer of 1951.

## EARLY MAN

IZTAPAN, MEXICO. In March the newly-created Direccion de Prehistoria, of the Instituto Nacional de Antropologia e Historia of Mexico (see below, under "Middle America") began the excavation of a mammoth skeleton near the village of Santa Isabel Iztapan, in the dry bed of Lake Texcoco about one mile south of Tepexpan and 18 miles northeast of Mexico City. The mammoth had been discovered two years earlier during the digging of a drainage ditch, when parts of the skull and tusks and one molar were recovered by the paleontologist Manual Maldonado Koerdell. When facilities were available this year, Maldonado and archaeologist Luis Aveleyra began to remove the overburden from the entire skeleton. On March 15 the first artifacts were found in place among the bones, and Don Pablo Martinez Del Rio, director of the new department, sent telegrams to some archaeologists in the United States. On March 17, Miss H. M. Wormington of the Denver Museum of Natural History flew to Mexico City; on March 19, Dr. E. H. Sellards, director of the Texas Memorial Museum, and Alex D. Krieger, archaeologist of the University of Texas, flew down. On March 20, the three Americans and many Mexican scientists witnessed the removal of three artifacts from among the bones.

One of the artifacts is a gray flint projectile point embedded between two ribs. It has slight shoulders and the stem edges are smoothed. The Americans present agreed that it is very probably of the Scottsbluff type, now known to be associated with extinct bison in several localities in the Great Plains region of the United States. The two other artifacts in place are obsidian flake scrapers, unworked on one face and chipped with steep edges on the other. A fourth artifact lay next to one of the vertebrae when first seen, but had slipped overnight into the ground water just below. This artifact is of light tan-colored flint, triangular, and rather crudely

chipped on both faces, but since it has a somewhat thickened, steeply chipped base, it may be an end scraper rather than a knife or projectile point.

During the next two weeks the exceedingly well preserved bone material was carefully removed and two more artifacts found. One of these, found by Sra. Sol Rubín de la Borbolla, is a long prismatic obsidian flake scraper not unlike those so common in central Mexican ceramic cultures. The other is a long oval whitish flint scraper with one end notched and chipped in the manner of some burins in the Old World and Alaska. The three flint artifacts must have been brought into the Valley of Mexico from elsewhere, for such material does not occur there naturally.

There can be no question that the six artifacts were in primary association with the mammoth, nor that this animal was killed and dismembered on the spot. Except for the head parts destroyed earlier during the ditch digging, practically all the skeletal parts were found, some articulated and some strewn about close by. Neither can there be any question that the remains were embedded entirely within the lake deposits of the Becerra formation, belonging to late Wisconsin glacial time.

The excavation was masterfully conducted by Aveleyra and Maldonado. A great many photographs were taken at all stages of the work, and a complete plan made of the bones and artifacts in place. A manuscript has already been prepared in April and is to be submitted soon for publication in *American Antiquity*.

NACO, ARIZONA. Recent excavations near Naco, Arizona, on Arizona Public Service Company property, have revealed new evidence of an ancient hunt which resulted in the killing of a mammoth, E. W. Haury reports. Fred Navarrete of Naco, and his son Marc, attracted by bones exposed by floods in an arroyo bank one mile north of the Mexican boundary, removed two large chipped projectile points from near the skull and left shoulder blade. They reported their discovery to the Arizona State Museum, University of Arizona, Tucson, which sent a party to the spot (April 14-18) for further exploration. Present were: Ernst Antevs, widely known for his work in geologic-climatic dating; John Lance, paleontologist, University of Arizona; E. B. Sayles and E. W. Haury of the Arizona State Museum staff; and four students.

A third point was found in disturbed ground of earlier diggings, and five additional missiles were recovered among the ribs and cervical vertebrae. While none of the latter were imbedded in bone, three were in contact with bones. The circumstances of these occurrences leave no question whatever of the association.

The eight projectiles, all classed as the Clovis Fluted type, range in size from 2¼ to 4 11/16 inches in length. It is well known from EARLY MAN stations in Southwestern states, but this is the first occurrence of the Clovis type of fluted point in direct association with an extinct mammal in Arizona.

Dr. Antevs states that the geologic history warrants a minimal date of 10,000 years ago for the kill. The species of mammoth has not been determined.

A three foot square block, including the five points found *in situ* was jacketed and removed to the Arizona State Museum for future display.

OTHER CURRENT EARLY MAN PROJECTS. The extensive site at Lind Coulee, Washington, is mentioned below under PACIFIC NORTHWEST. An early site in the Lime Creek, Nebraska, area is mentioned in the report below of the Ninth Plains Conference. Paleo-Indian sites in Georgia and Florida are briefly reported under SOUTHEAST. Students of W. C. Holden at Texas Technological College, Lubbock, carried on further excavations at the Lubbock site, where Glen Evans of the Texas Memorial Museum worked the past two summers. A recent article of special interest in connection with EARLY MAN, published in a journal probably not regularly seen by many archaeologists, is: Wilson W. Crook, Jr., "The Wheeler site: a 3,500-year old culture in Dallas County, Texas" (*Field and Laboratory* XX:43-65, No. 2 April, 1952, Southern Methodist University, Dallas).

## ARCTIC

A quarter-century has passed since Diamond Jenness defined the Dorset culture in a limited area of the eastern Arctic, and today Dorset problems are again coming to a sharp focus. Recent articles by Collins, Harp, and Meldgaard have stressed the range of area and typology of Dorset to a point where we no longer expect a simple solution of origins in terms of the western Eskimos, and Eigil Knuth's discovery of extensive sites in the remote northernmost tip of Greenland offers the possibility of correlating Dorset remains with climatic change.

The Cape Dorset site on Mill Island, examined by Deric O'Bryan in 1947, and excavated by him in 1951, offers the first information about a Dorset house that is not obscured by later Thule deposits. The Mill Island house site appears to have been built and occupied by two families; two living areas were separated by a storage space. The house was occupied only once; debris was not stratified by plant growth nor by weathered surfaces. The ruin was well hidden from sea approaches, possibly by intent, perhaps to benefit from a protected southern exposure. A study of the numerous animal bones shows seal and walrus, which still frequent the area, to have been the first attraction, but the original settlers found a number of caribou which seem later to have disappeared.

Some 350 archaeological specimens were found, less than two per cent of which cannot be classed as true Dorset. The conspicuously aberrant specimens either show a combination of Cape Dorset and Thule techniques or are Thule. Fragments of wood, and an oil cake containing feathers, are thought by O'Bryan to be suitable for radiocarbon dating.

Another somewhat enigmatic cultural designation is Birnirk. Long treated as the grandparent of Thule culture, Birnirk has failed to emerge in the literature as a fully-defined and widespread stage of western Eskimo development, although Birnirk special forms of harpoon heads are to be found as far south of Barrow as Cape Prince of Wales and St. Lawrence Island in the lower levels of middens. We are now promised a fuller description of Birnirk at Point Barrow from Ford's early excavations and from recent excavations directed by J. O. Brew and Wilbert K. Carter.

Based at the Arctic Research Laboratory of the Office of Naval Research, Carter's party excavated during the 1951 season in several sites near Barrow village. At the type site of Birnirk a fortunate choice led to excavation of a rich house-mound which yielded 1119 artifacts, many in such excellent preservation as to be good museum display specimens. Approximately a hundred artifacts were found associated with the partial skeleton of a young male, including a wooden box with a handle like a frying pan filled with hair of bear or wolf. In this box were typical Birnirk harpoon heads and several bone and ivory projectile points. In other sections of the excavation were found a great variety of artifacts that should aid in rounding out a picture of the economy of Birnirk people. Carter expects to return to Barrow in 1952 with a staff of five people. A number of different sites and periods will be investigated, including considerably more work in the type site of Birnirk.

Also under a grant from the Office of Naval Research, William Irving will carry on an archaeological survey of the lower Colville River during the 1952 season.

James W. Van Stone, University of Alaska, will survey the archaeologically unknown Nunivak Island, excavating if suitable sites are found. He is supported by a grant from the Arctic Institute of North America.

J. L. Giddings, Jr., assisted by Alex Ricciardelli, a graduate student in anthropology at the University of Pennsylvania, expects to begin a summer season in Alaska by looking into a series of reported limestone caves in the Firth River headwaters of northeastern Alaska, and to collect samples of the spruce forest in the same area. Further plans include a trip around the north coast of Alaska in a survey of driftwood and archaeology, and, later, investigation of tree growth about the Churchill region of Hudson Bay.

A program of combined ethnological and archaeological investigations, coordinated with linguistic studies, will be undertaken at Yakutat, Alaska, this summer under grants-in-aid from the Wenner-Gren Foundation for Anthropological Research to Bryn Mawr College and the University of Washington, supplemented by support given to two graduate students by the University of California. The University of Pennsylvania Museum is also sponsoring the expedition. The work will be a continuation of the research begun by Frederica de Laguna among the northern Tlingit in 1949 and 1950, the ultimate purpose of which is to study the development of Tlingit culture and to analyze, as far as possible the forces and factors affecting the formation, enrichment, and decline in modern times of the distinctive patterns of northern Tlingit culture. Yakutat has been selected because the present native community represents a mixture of the older Eyak-speaking population and of more recent Tlingit immigrants from southeastern Alaska. Francis A. Riddell, Donald McGeein, Arthur Freed, and Kenneth Lane, graduate students at the University of California, will excavate at Eyak sites near the town of Yakutat; Frederica de Laguna, Bryn Mawr College, will be in charge of the party, and with Catharine McClellan will concentrate on obtaining native traditions concerning the history of the area and the changes supposedly introduced by the Tlingit. Dr. Fang-Kuei Li, University of Washington, will make a study of Eyak linguistics, which it is hoped will help us to place this little known, and almost vanished people, in their proper cultural perspective.

ALEUTIANS. With funds provided by the Arctic Institute of North America (Office of Naval Research contract), and the Graduate Council, University of Oregon, the Department of Anthropology will send seven persons to continue anthropological research in the Aleutian Islands. Studies will be made in the fields of archaeology, linguistics, ethnology and physical anthropology. The members of this party are G. H. Marsh, linguist; John James, Dept. of Sociology who will study small group organization; J. W. Leach, archaeologist; P. T. Spaulding, who will work primarily in archaeology; G. Berreman and P. Newman, who will work on archaeology and ethnology; and W. S. Laughlin.

The base for the research will again be the village of Nikolski, Umnak Island. A number of specific problems have emerged from the past studies. First, a lamellar flake industry exists in the Aleutians and we wish to determine if it preceded or was a part of the early culture brought in by the paleo-Aleuts. A second problem involves the time of arrival of the neo-Aleut people. Owing to the fact that in some places the paleo-Aleuts continued their separate existence as a physical population up to the arrival of the Russians, we wish to find out when the neo-Aleuts expanded out into the chain and if possible, to what extent they mixed with the earlier paleo-Aleuts and to what extent they displaced them. A third problem, arising from the fact that there appears to be no division into culture periods, is the identification of the culture traits introduced by the neo-Aleuts. A fourth problem is the direction of movement followed by the later neo-Aleuts. As a consequence we are confining our researches of this season to the eastern Aleutians where the contemporary dialect distribution may be compared with the earlier distributions recorded by the Russians and still shown in place names. For this reason we intend to investigate the interesting dialectical variation not previously reported for the village of Akutan where there is some linguistic evidence that they moved in from the north side of the Alaskan peninsula. In general, it appears that the eastern dialect and some of the traits which have been considered typically Aleu-

tian, such as mummification and ground slate blades, are relatively recent in the area of western Unalaska and Umnak Island. There is as yet insufficient evidence for associating many of the cultural traits with either of the two physical populations, and there clearly appears to be a continuous succession of material remains. Many items will be given special attention such as the possible existence of true pottery.

The combination of the radiocarbon date, the linguistic analysis of Aleut-Eskimo correspondences and the depth and number of the village sites indicate a time of not later than 4000 yrs., for the arrival of the proto-Aleut-Eskimo stock in southern Alaska. In addition to understanding the history of the Aleutian development it will be necessary to correlate this history with other prehistoric developments in southwestern Alaska in order to understand the rise of the Eskimo division of this stock. Insofar as the physical differentiation into an earlier longheaded population and a recent roundheaded population, a phenomenon apparently widespread in western and southern Alaska, it is essential to consider the various genetic processes by which this may have come about within the stock rather than to resort to facile explanations of admixture or invasion from peoples outside the stock.

## NORTHERN MISSISSIPPI VALLEY

ILLINOIS. The Illinois State Museum has just published *Hopewellian Communities in Illinois*, Thorne Deuel, editor. It contains site reports by Winslow Walker, John McGregor, Georg Neumann and Melvin Fowler, an over-all analysis of Hopewellian pottery types by James B. Griffin and a summary of Hopewellian culture by the editor. This is the first archaeological volume in the Museum's Scientific Series.

The Illinois State Museum and the University of Chicago's Department of Anthropology are planning to carry on archaeological field work in the Kaskaskia village in Randolph County, Illinois, beginning June 15. This is the village to which the Kaskaskia Indians moved from the Starved Rock area shortly after 1700. They are known to have lived here more than one hundred years. The main purpose of the summer project will be to isolate the cultural materials belonging to the Kaskaskia Indians and to compare them with the remains left by the same people in La Salle County. The La Salle County sites were explored by the Museum and the University of Chicago in 1946-49 under the direction of John McGregor assisted by Kenneth Orr. A party of ten persons will be in the field for eight weeks under the direction of Melvin L. Fowler, Curator of Anthropology of the Museum.

Unless unexpected new sources develop, J. J. Bauxar will complete the text volume (Part II, Vol. II, Scientific Papers Series) of *Indian Villages of the Illinois Country* by early fall. This deals with the historic villages known by documentation and/or through archaeological survey. Part I, Atlas, of this volume compiled by Sarah J. Tucker was issued in 1942.

John C. McGregor of the University of Illinois is to have a party in the field during June and July working on the Illinois River with headquarters in Jacksonville at Illinois College. The project is to explore some sites presumedly later than the Pool site which was excavated two years ago and, if possible, some earlier villages as well. The report on the excavations at the Pool site is about ready to go to press.

INDIANA. The Indiana Historical Society, Indiana University and the Indiana Department of Conservation will again jointly sponsor the Field School at Angel Mounds this summer. This is the 8th year of such activity.

WISCONSIN. Attention will be directed this season toward practical work in the restoration of the Middle Mississippi village of Aztalan. The State Conservation Department will rebuild a portion of the stockade wall which originally surrounded this site.

## PACIFIC NORTHWEST AND CALIFORNIA

Charles E. Borden, University of British Columbia, continued excavations at Stelax Village, Musqueam Reserve. The earliest deposits at this site reveal an early cultural horizon with traits markedly different from those of the late prehistoric deposits. Increasingly abundant evidence of the existence on the Reserve of an early culture different from that of the late coastal culture is manifest in artifacts collected on the surface of neighboring sites on higher ground overlooking the geologically recent bottomland on which the present Musqueam villages are located. More extensive investigations should reveal whether the recent Musqueam culture is intrusive or whether the earlier complex on the Reserve represents the base from which it developed. Borden has also salvaged a collection of artifacts from a Vancouver City site on the south shore of English Bay. Stone vessels and perforated stones, and many of both types in varying stages of manufacture, form a large proportion of the implements in the collection. In June Borden will excavate at Chinlac village on the Stuart River and at other sites in Carrier Indian territory and, during July and August, will move to Tweedsmuir Park to excavate at a selected few of the 130 sites that were discovered during the 1951 reconnaissance.

The University of Washington will be carrying on archaeological work in several parts of the state during the summer. Carroll A. Burroughs will conduct the annual summer field session and supervise shell mound excavation on San Juan Island. Douglas Osborne will direct student groups in an archaeological survey of the Okanogan region of North-central Washington, a cave survey in central Washington, and further excavation in the McNary Reservoir on the Columbia River. Warren W. Caldwell, working on the problem of burial customs in the Northwest, will excavate cairns in the San Juan Islands and adjacent areas.

Richard D. Daugherty, State College of Washington at Pullman, will continue work at the Lind Coulee site in eastern Washington. This early man site, discovered by Daugherty two years ago, appears to be extensive, was partially excavated last summer, and has thus far yielded over a hundred artifacts and quantities of other cultural debris.

The University of Oregon will have a field party of about ten students excavating for six weeks at a village site on the sand spit at the mouth of the Coquille River at Bandon, Oregon. This work is a part of the long-range project on the archaeology of the Oregon coast. The site is large and appears to show a very long occupation from what seems to be superimposed house pits. If this impression is confirmed by excavation, the site should be important in showing the northward extension of the northwest California patterns upon the earlier coastal adaptation. This theory of the northward extension of patterns is based upon ethnographic data and the excavations by Berreman and Schumacher. The northern limits of the California influence is thought to have been in the region of Coos Bay about twenty miles north of the site.

The annual Northwest Conference was held at the University of Washington, May 2-3. Represented were: University of Oregon, Reed College, Oregon College of Education, University of Washington, State University at Pullman, Western Washington College of Education, University of Idaho, University of British Columbia, and the Provincial Museum. About 150 people attended.

The Department of Anthropology of the University of California and the University of California Archaeological Survey report the following archaeological activities for spring and summer:

Excavation of a San Francisco Bay shell mound by fifteen students enrolled in the week-end field class in archaeological methods and directed by Clement Meighan, UCAS archaeologist.

Excavation by A. E. Treganza, San Francisco State College, of two open sites in the Sierra Nevada foothills in Calaveras County. This work is supported by the University of California Archaeological Survey and represents a continuation of his last summer's digging at Farmington Reservoir. One of these late prehistoric sites continues into the historic period with a terminal date estimated at about 1870. It is extremely rich and has already produced a great quantity of objects of Caucasian as well as Indian manufacture.

Excavation by Meighan of the burial cave near Murphy's in Calaveras County. The fortunate circumstance of its being very productive and undisturbed make it important in being the first Sierran burial cave to be scientifically excavated.

Completion by Martin Baumhoff, University of California Archaeological Survey Assistant Archaeologist, of a project of plotting on a 1/1,000,000 base map of California the location of all sites excavated concerning which there exist published accounts or unpublished manuscripts, full field notes, and collections housed in scientific institutions. The result of this inventory project is the realization that a surprisingly large number of sites have been properly excavated and that the coverage of a state as large as California is rather general. This map and the accompanying bibliography will be kept up to date, and within a few years will be published as a guide to the basic data for California archaeology.

Projected excavation of a dry cave in Shasta County by Baumhoff and of a dry cave in Monterey County by Meighan.

Projected archaeological survey of Yosemite by J. Bennyhoff and of the Lava Beds National Monument by R. J. Squier, both under contracts between the University of California and the National Park Service.

Projected archaeological site survey by A. E. Treganza in fifteen Corps of Engineers and Bureau of Reclamation reservoir areas in central California and western Nevada during the summer.

A Summer Session class in archaeology under Richard K. Beardsley, University of Michigan, in the valley of the Cosumnes River.

William J. Wallace, University of Southern California, directed a field methods class in the excavation of a shell mound at the mouth of Little Sycamore Creek in Ventura County. The site yielded a fair number of artifacts but of rather limited varieties. Manos, metates, pitted hammerstones and unmodified hammerstones were abundant. Projectile points were few, large and crude. Burials, five of which were uncovered, were flexed, face down. The cultural assemblage seems old. A heavy calcareous layer and incrustation on artifacts suggest antiquity. The human bones are rather heavily mineralized.

The Archaeological Survey Association of Southern California conducted an archaeological survey of Black Canyon to locate sites, make surface collections, and record petroglyphs.

## PLAINS

The Ninth Plains Conference for Archaeology met in the Laboratory of Anthropology at the University of Nebraska on April 11 and 12, 1952, with Paul Cooper as chairman. The program included ten papers, a motion picture, and two symposia. Carlyle S. Smith was elected chairman of the next conference.

Five papers were read by members of the staff of the River Basin Surveys, Smithsonian Institution. Donald D. Hartle reported on the excavations at Rock Village, an early nineteenth century Hidatsa site in the Garrison Reservoir, North Dakota. He concluded that the houses conform with well documented Hidatsa dwellings. G. Hubert Smith described the findings at Fort Stevenson, a late nineteenth century military post across the Missouri River from Rock Village. George Metcalf presented a study of the relative proportions of collared and uncollared rims in seven Upper Republican sites in Nebraska. A seriation was established but there was no

evidence to indicate whether the predominance of collared rims marks the early or late end of the sequence. Franklin Fenenga discussed the temporal and geographic distributions of Southern Cult art motifs in reference to the Plains. He found that such items correlate in time with the Upper Republican culture. Richard P. Wheeler reported on excavations in the Keyhole Reservoir, Wyoming, discussing small lithic and ceramic sites and the Mckean Lanceolate point.

Members of institutions working under cooperative agreements with the National Park Service presented four papers and a motion picture. James H. Howard summarized the work of the State Historical Society of North Dakota at Fish Hook Village in Garrison Reservoir, the last earthlodge village on the Missouri River. Wesley R. Hunt described and interpreted the excavations carried on by the University of South Dakota and the State Archaeological Commission at the Scalp Creek site in Fort Randall Reservoir, South Dakota. Three stratified components are present. E. Mott Davis described the work of the Nebraska State Museum at the Red Smoke site, an early lithic station in the Lime Creek area of Medicine Creek Reservoir, Nebraska. Emphasis was placed upon the discovery of Meserve and Plainview points in the same level. Marvin F. Kivett reported on the work of the Nebraska State Historical Society at two earthlodge villages in Fort Randall Reservoir, South Dakota. Close resemblances to Lower Loup culture and to the Talking Crow site were noted. Carlyle S. Smith made comments in conjunction with a motion picture showing the work of the University of Kansas at the Talking Crow site in Fort Randall Reservoir. The film emphasized the methods used in excavating circular earthlodges.

Mary Louise Freed summarized her study of the data from the Lynch site in northeastern Nebraska, a site excavated as part of a WPA project in the 1930's. The pottery is mixed in cultural affiliations, suggesting Upper Republican, Nebraska, Lower Loup, and Oneota. The field notes do not indicate stratigraphic relationships.

James B. Griffin led a symposium on Plains Woodland cultures. A chronological chart showing the principal Woodland and Hopewellian manifestations in central North America was used as a frame of reference. Griffin emphasized the sequences established east of the Plains as an aid in ordering the unstratified components. In the Scalp Creek II horizon reported by Hurt, he saw evidence for a transition from Woodland into the late manifestations of which Upper Republican forms a part.

A symposium on the problem of classifying pottery in the Plains was led by Carlyle S. Smith. It was generally agreed that ceramic data should be presented in a uniform manner so that direct comparisons will be possible from site to site without the necessity of reworking the statistics. The seriational technique used by Ford was considered directly applicable to similar problems in the Plains. It was agreed that pottery types should be divided into wares, then groups, and finally traditions whenever possible as a means of demonstrating ceramic relationships. Wesley R. Hurt read a paper on three ceramic groups he has identified in South Dakota. A paper by James Gunnerson on pottery types in the Nebraska aspect was read by G. Hubert Smith.

CADDOAN AREA. A "Caddaon Area Workshop Session" was held April 22-23, 1952, at the University of Oklahoma, Norman, Oklahoma. Participants were David Baerreis, Robert E. Bell, James Ford, William Haag, Lynn Howard, Edward Jelks, Alex Krieger, Karl Schmitt, Charlie Steen, and Clarence Webb. This detailed report of the proceedings has been furnished by Bell.

For the University of Oklahoma, Bell reported that last summer he worked at two sites on the Illinois River; the Morris site and the Vanderpool site. The Vanderpool site appears to be fairly early in that it has many typical Archaic projectile points. In addition it has a small amount of a thick, granular clay tempered pottery. One house was found associated with the complex, a square four-centerpost house with trench entranceway. It resembles those reported for the Spiro focus. The Morris site is apparently a mixed occupation. The 15 burials excavated and a portion of the village debris, appear to represent the Fulton aspect and may be related to the Fort Coffee or the Turkey Bluff focus. Some specimens of the clay-tempered pottery suggested an earlier occupation.

Donald Lehmer of the River Basin Surveys, Smithsonian Institution, excavated at the Cookson site in the same area and a preliminary report on his material has appeared in *American Antiquity* (April, 1952). The Cookson site is definitely a part of the Fulton aspect and related to the Fort Coffee focus. However, because of certain differences, Turkey Bluff focus has been suggested as a name for this new manifestation.

Several sites have been excavated in the Eufaula Reservoir by the University of Oklahoma in cooperation with the National Park Service. The material associated with most of the sites was very limited. A series of houses was found, ranging from four-centerpost square houses through two-centerpost rectangular to circular. The chronological relationships of these types is not apparent. One site produced a small amount of historic Creek material, currently being studied by Charles Proctor. Harold Brighton is presently conducting a survey of the Keystone Reservoir, as one phase of a contract with the National Park Service, and has thus far reported 28 sites along the Cimarron River, most of which lack pottery.

Clarence Webb reported that Robert Fulton, from the University of New Mexico, last summer had worked the Bellevue mound located on Bodcau Lake in northwestern Louisiana. The pottery from the site, with the exception of 4 or 5 sherds, is undecorated and clay or bone tempered. The decorated sherds found appear to be Marksville types. Two burials were found, one of which was under a red clay capped primary mound similar to clay capping found in the later Caddoan periods. The projectile points seem to be identical

with Archaic types found in eastern Texas, which last into the Gibson period. Webb also reports that several Scottsbluff projectile points have been found in one area in Louisiana. There is no definite site but merely a concentration of the points within a fairly limited locality.

Baerreis is still concerned with analyzing and publishing materials excavated some years ago from the Smith site in Delaware County, northeastern Oklahoma. The Smith site is composed of two bluff shelters which contain fairly deep deposits. The upper four feet include ceramic materials. The pottery is essentially a shell tempered type characteristic of the eastern Oklahoma section of the Caddoan area in Fulton aspect times. The Smith site differs from Neosho focus sites in that most of the pottery is without decoration. This has been tentatively named *Woodward Plain* and appears to be similar to pottery of the Fort Coffee and Turkey Bluff foci.

Karl Schmitt has assembled considerable data on Caddo and Wichita burial customs, and a paper on "Wichita Death Customs" is in press in *Chronicles of Oklahoma*. Caddo burial practices have changed considerably within recent years and probably would be of little help in identifying early historic burials. Schmitt also reports progress in assembling information on historic Creek, Choctaw, and Caddo pottery.

Schmitt reported on materials from the Washita River focus, pointing out that this Plains-oriented complex has many large sites and is an important archaeological manifestation. One house excavated at the Lacey site in Garvin County was about 30 feet square with a circular fireplace and a double wall along the eastern side. It has a basically four-centerpost construction. The pottery wares of the Washita River focus contain a great variety of tempering material, including shell, bone, sandstone, limestone, and other materials.

Lynn B. Howard reported on his work at the Battle mound (1948) on the Red River, in Arkansas, where he is examining the transition from Gibson aspect to Fulton aspect complexes. Some of the Battle mound pottery appears to be closely related to the Haley focus, especially in the brushed wares. He notes that there appears to be a general transition from Haley to Bossier materials at the Battle site. This agrees with his findings on the lower Ouachita River this last summer.

Edward B. Jelks reported having made minor excavations at several sites in the Belton Reservoir southwest of Waco on the Leon River. These sites consisted of Edwards Plateau aspect and Central Texas aspect components, and five of them contained Caddoan pottery. The pottery, which includes engraved, incised, brushed, and plain ware, appears to be associated with the Central Texas aspect components. The only pottery type definitely identified as to type is *Holly Fine Engraved*, which occurred in three of the sites. A number of Copena type blades, also associated with the Caddoan pottery and the Central Texas aspect, add to the evidence of contact between central and east Texas. Jelks is working up a report on the Belton sites and is preparing to excavate at the Texarkana Reservoir on the Sulphur River in northeast Texas.

Willaim Haag who has recently moved to Louisiana State University, reported that there is now recognized in the lower Mississippi Valley an archaeological horizon which he believes was one of the more important ones in central North America, the Poverty Point material announced by Webb in *American Antiquity*. In the spring of 1951, Phillips and Ford excavated at the Jaketown site to work out a sequence of pottery types. Through exposures in a borrow pit, they were able to obtain considerable information about a Poverty Point horizon at the site. Haag reports the finding of hundreds of small flint objects similar to those at Poverty Point. At the present time, Ford is preparing a report on the relationships of the Jaketown site with the former river drainage, Phillips is working on pottery sequences, and Haag is analyzing the flint industry. James A. Ford reported on excavations at the Poverty Point site. An aerial photograph reveals six concentric octagonal earth works having an outside diameter of at least one-half mile. The earth works appear to be associated with the Poverty Point culture, and he is now trenching the area to learn more about the complex. So far, absolutely no pottery has been found. Further work at Poverty Point will undoubtedly modify some of our present opinions about what constitutes the Archaic.

The rest of the session was concerned largely with discussion of pottery types in the Caddoan area. It was finely agreed by the group that currently recognized types should be written up in standard form and be published in the *Southeastern Conference Newsletter*. It was also agreed that, before publishing a new pottery type, a tentative description outline should be mimeographed and circulated to the members of the conference. Baerreis presented mimeographed material upon several types which were considered. These include the *Cooper* types, and *Woodward Plain*. Webb discussed some of the *Bossier* types and described some of their distinctive characteristics.

Some difficulties in terminology when applied to plain shell tempered wares were evident. For convenience it was decided that some wares might be differentiated primarily upon the basis of geographical locality. For example, for the most part *Nocona Plain* could not be distinguished from *Woodward Plain*. Krieger then brought up the matter of tabulating results on the basis of rim or decorated sherds versus all sherds. In order to make published data easier to compare objectively, Krieger suggested that we attempt to break our tabulations into two sections so that either method might be used. There seemed to be general agreement among the members present that many superficial pottery types are already listed in the literature in some areas, and that an effort should be made to keep the total number down by including more variations.

## SOUTHEAST

GENERAL. The 1952 session of the Southeastern Archaeological Conference will be held at Ocmulgee National Monument, Macon, Georgia, on Friday and Saturday, October 31 and November 1, 1952. The first morning will be devoted to a discussion of chipped stone typology as proposed at the last meeting.

The new business of the conference will be a detailed examination of the historic Indian groups of the Southeast from a combined archaeological and ethnological viewpoint. An attempt will be made to demonstrate definite trait lists and complexes for the various groups. It is proposed that each discussant deal with the following headings: the early history of the group, village locations with some analysis of the validity of identifications, trait lists of aboriginal and European objects at the protohistoric and full historic levels, and inter-tribal relationships.

ARKANSAS. The University of Arkansas Museum is in the process of moving from its present location in the basement of the Library Building to its new quarters in University Hall. The entire fourth floor of that building is in the process of being remodeled and when completed the museum will have over 15,000 square feet of storage and display space. It is hoped that the new museum will be ready for opening in the fall. The University of Arkansas will not have a Summer Field Session this year, due to the problems connected with the moving of the museum, and also, because Mr. Howard is taking a year's leave of absence to work on his doctorate at the University of Michigan.

KENTUCKY. Dr. Charles E. Snow has returned from a seven months stay in Hawaii where he has been on leave, doing research on Hawaiian skeletal material at the Bishop Museum. He will resume his active duty at the University, July 1st, 1952, at which time he will become head of the Department of Anthropology. Dr. William S. Webb has reached the age of retirement, and has now become Professor Emeritus. Dr. Richard B. Woodbury has resigned his position as Assistant Professor of Anthropology effective July 1, to accept a position at Columbia University.

GEORGIA. Ocmulgee National Monument reports that the new museum has been very popular. G. D. Pope is at work on a handbook covering the archaeology of the monument area. C. H. Fairbanks has just finished a report on the excavation of two 18th century houses at Fort Frederica National Monument. No field work is planned for the immediate future.

W. H. Sears, University of Georgia, will return to Kolomoki Mounds State Park for his fifth season of summer exploration at the site. The excavation of two small mounds constitute the projected work. Sears has just completed and sent to press his report on the 1950-51 season of exploration at Mound D, Kolomoki. Also, in preparation, for publication this year, in the Anthropology Series at Georgia, are Joseph R. Caldwell's report on Wilmington and Deptford sites of the Georgia coast, and A. R. Kelly's report on the Swift Creek Site.

Beginning exploration at the site of Tugalo, historic Cherokee landmark on the Tugalo River, near Toccoa, Georgia, is tentatively slated for late May and into the summer (1952). The best documented 18th-century Cherokee site in Georgia, it comprises a large "mound" considered to be a collapsed earth lodge and an extensive village area.

The fifth annual field session in archaeology of the University of Georgia will return to Bartow County, northern Georgia, and will concentrate again on limestone cave exploration in search of more Copena-like burials. Also, a site survey and trench exploration will be carried out at Coosawattee Old Town, Carter's Quarters, near Fairmount, Georgia.

A. R. Kelly will carry out two survey assignments in May, one at the Chinchifoonie site on Highway 19 near Albany, Georgia, where Kelly, George F. Carter, and V. P. Sokoloff found a hilltop midden approximately 4 feet deep exposed in the highway cut, which Sokoloff on geochemical grounds has stated shows trace mineral indications of a greater age than can be determined at present by radiocarbon methods. Also, in Bulloch County, Statesboro, Georgia, Kelly will examine another road profile which Sears examined and tentatively thought might be either a sand burial mound or a cemetery area in weathered hammocky loam.

McIntosh County, on the Georgia coast (Darien County seat), is sponsoring an archaeological survey at the Ft. King George site, under the direction of Sheila Kelly Caldwell. Mrs. Caldwell has been working about one month on the area of a proposed parking lot and entry road and has found several structures, wall trenches with postmold, wattle and daub continuities. Remains include historic Spanish and Indian objects tentatively ascribed to the Huspaw Indians. The situation is complicated by the overlay of later colonial remains belonging to old Darien settlements, established soon after Savannah in early 18th century.

FLORIDA. The Department of Anthropology and Archaeology, Florida State University, has been working on paleo-Indian sites in southern Jefferson County. This particular area has not been investigated before and many early sites found indicate that there was a relatively heavy early population.

Ripley P. Bullen for the Florida Park Service conducted a two week excavation at the newly developed Manatee Springs State Park. Portions of a small Weeden Island village were uncovered producing pottery, arrowpoints, food bones and many pits and postholes. Unfortunately, a house pattern could not be made out. One of the pits was seven feet across and reached a depth of five feet below the present surface which was at least eight inches higher than at time of occupation. As this is the first excavation in an inland Weeden Island period village in Florida, it should substantially increase our knowledge of this period.

The University of Florida excavation continued during the spring at Spalding's Lower Store. Further work was also carried out at Shired Island in Dixie County, yielding a greater inventory of cultural materials particularly early ceramic types (Orange Incised, St. Johns Incised, and Pasco Incised) as well as considerable exotic material such as steatite vessel sherds. Several Caribbean area projects of the University are discussed in another section.

A major highlight of the year at the University is the temporary show "Calusa Art in Wood." Through the courtesy of the University of Pennsylvania Museum an excellent series of Key Marco wooden artifacts were exhibited along with some local pieces.

## SOUTHWEST

During the past winter the only archaeological field project carried on in the Southwest was the survey of Organ Pipe Cactus National Monument, conducted by Paul Ezell for the National Park Service. Important developments relating to Southwestern archaeology are reported briefly above under the heading of "Dendrochronology."

Completion of reports on past work has occupied the staff of the museum of New Mexico, Santa Fe, and National Park Service archaeologists at the Region Three Office in Santa Fe and Mesa Verde National Park.

Summer field schools in archaeology will be held by the University of Colorado, the University of New Mexico, Texas Technological College, and the University of Arizona.

The University of Colorado group directed by Robert Lister and Herbert Dick will join with the Denver Museum of Natural History party under Marie Wormington to continue excavation of a cave on East Creek near Grand Junction, Colorado, from June 16 to July 22. They also plan a reconnaissance of the Uncompahgre Plateau, and of Montezuma Creek in Utah.

The University of New Mexico Field School will be in two sections. The first, under the direction of Paul Reiter, will complete excavation of a cave in Lincoln County begun in 1950, then move to Hidalgo County in southwestern New Mexico to excavate a rock shelter. Florence Hawley Ellis will be in charge of the second section, which will excavate at the historic site of Pojoaque 14 miles north of Santa Fe, and gather whatever ethnological information remains among the residue of population of this pueblo which was abandoned about fifty years ago.

Students from Texas Technological College under the direction of Holden will return to the Bonnell site, 14 miles east of Ruidoso, N.M., from July 15 to August 22. They plan to do some sampling on the Rio Peñasco to the south and the Macho to the north.

The work of the University of Arizona Archaeological Field School at Point of Pines, Arizona, under the direction of E. W. Haury, June 13 to August 8, will include excavation in a Tularosa Phase site, testing in villages dating from about 700-1000 A.D., and further exploration of the valley fill deposits to gather information relative to environmental conditions.

The annual Ruppe-Dittert expedition to Cebolleta Mesa, New Mexico, will be the main Peabody Museum effort this year, with an expanded crew and a grant from the Harvard Foundation for Advanced Studies; the work will include further tests at Acoma Pueblo. David de Harport, also from Harvard, will carry on reconnaissance in the Los Gigantes-Nokai Canyon area of northeastern Arizona. Jo Brew, who is spending the summer rushing around Africa, reports that Peabody is giving the Quemado area of west-central New Mexico a rest this year, having reached the stage there at which review of findings to date and revised final planning of the program for the future are necessary.

The Museum of New Mexico will excavate this summer in the historic pueblo of Cuyamungue, 15 miles north of Santa Fe. The site was occupied from about 1300 A.D. to 1700, and should give much needed information on the contact period of 1540-1700. Fred Wendorf will be in charge of the work.

At Pueblo Grande at Phoenix, excavation will continue during the summer on six acres adjacent to the main ruin where a part of a Hohokam village is located. Reconstruction will be made of suitable features for outdoor exhibits. Francis Cassidy is directing the work.

A special University of Colorado project directed by Robert Lister will attack the general problem of Southwest-Mexican connections in Chihuahua where the study of Casas Grandes culture will be undertaken as well as the excavation of several caves on the eastern edge of the Sierra Madre. A grant from the Wenner-Gren Foundation has been received for this work which will be carried on in August and September.

The major portion of the Anthropology Section of the Southwestern Division, A.A.A.S., meeting at Boulder, Colo., May 2, was devoted to a symposium on Colorado prehistory, by H. W. Dick, R. H. Lister, H. Marie Wormington, and Haldon Chase (Ruth Underhill presiding).

The 1952 Pecos Conference, annual get-together of Southwestern anthropologists, will be held in Santa Fe this year, and is tentatively scheduled for August 11-13. Erik Reed, National Park Service, Santa Fe, is chairman of the committee on program and arrangements.

## CARIBBEAN

The Fifth Interamerican Congress of Municipal History met in Cuidad Trujillo, Dominican Republic, April 23-30, 1952. Despite the title, one section (out of six) was devoted to anthropology, principally archaeology. Elected officers of this section include: President, John M. Goggin; Vice Presidents, Jorge Lines, Costa Rica and Alfonso Ortega, Mexico; Assesors, Emil de Boyrie Moya, Dominican Republic and Fernando Royo Guardia, Cuba; Secretary, Homero Henriquez, Dominican Republic. Other archaeologists were present from Cuba,

Venezuela, Haiti, Mexico, and the United States. Papers given ranged widely in topic and nature but were principally concerned with Middle American and Caribbean themes.

In conjunction with the Congress, the newly reorganized National Museum of Anthropology was formally opened. Much of the redesigning of exhibits was carried out by Rene Herrera Fritot of the University of Havana. Another special exhibit of colonial jewels and church plate, from the Cathedral treasure, was an unexpected surprise. It included much early Mexican silver work and jewelry, among which was a prehistoric Mixteca quartz skull set in colonial gold work.

The University of Florida has been developing its research interest in the Caribbean area. Two field trips in December, 1951 and February, 1952, took John M. Goggin to Cuba. While attending the Interamerican Congress of Municipal History, in the Dominican Republic, Goggin found opportunity to study local collections, and to make surface collections, and some limited excavation in prehistoric and historic Indian and Spanish colonial sites. The program of colonial ceramic study being carried out in Florida and Mexico has been greatly aided by this new material. A brief visit in Haiti allowed the examination of public and private collections there. In the immediate future work is shifting to the southern Bahama Islands. Goggin will participate in a cruise early in June which will permit reconnaissance visits to Long, Crooked, Acklins, Rum and Cat islands.

## SOUTH AMERICA

The Carter Collection of prehistoric Peruvian ceramics and textiles at Florida State University has just been doubled, and an entirely new Panamanian collection has been added to the University Museum through a recent gift, Lothar P. Witteborg, curator, reports. With the addition of the new Peruvian material, the Carter Collection becomes one of the finest collections of Nazca ceramics and textiles in North America. The Carter Collection was originally given to the University 10 years ago by Mary Patterson Carter and John V. Carter, now residing in Panama.

The Panamanian collection is a gift of the National Museum of Panama, numerous Panamanian collectors, and the Carters. The material from Panama is made up of ceramics, stone work, and gold objects; it too is one of the finest representative collections of its kind in North America.

## MIDDLE AMERICA

MAYA AREA. From mid-January through April, H. E. D. Pollock reports, Carnegie Institution of Washington conducted a second season of archaeological investigations at the ruins of Mayapan as a part of its new program of operations in Yucatan. In previous years the site has been mapped and a survey of the numerous dwelling-type structures had been started. The present season was, however, the beginning of intensive work. The house mound survey, carried on by A. L. Smith and K. Ruppert, was continued. It had previously been noted from above ground examination that the house type at Mayapan closely approximates that described by Landa as the living quarters of a chief. The great number of such structures at Mayapan would seem to rule out the possibility that this type of dwelling was used only by the rulers. Several houses were excavated and a number of graves discovered beneath the floors. As might be expected, furniture tended to be simple and generally of a utilitarian nature. Paralleling the house mound survey, William Bullard, Jr., made an examination of the ancient stone boundary walls that are scattered throughout the ruins. Although more information is needed, there is reason to believe that it was standard practice for any dwelling or group of dwellings to be surrounded by a stone wall, presumably outlining the land immediately pertaining to the particular dwelling or dwellings. There is also the possibility such walls form a system of lanes leading from one house to another and to other parts of the city. E. M. Shook completed a study of the great wall that surrounds the entire site. In spite of careful search by excavation at several major gateways, only a very small amount of pottery and artifacts was found, and no confirmation was obtained of ceremonial dumping at the exits from the city. In an excavation in one of the few ceremonial structures so far examined, Shook found remains of human cremation, thus indicating a possible difference in burial custom as between the upper class and the commoners.

R. E. Smith carried on excavations in one of the numerous cenotes at Mayapan. The existence of an artificial platform on the floor of the cavern and a masonry stairway leading down to water suggest ceremonial and religious usage of the cenote. Pottery association indicates such practices in late Mayapan times. T. Proskouriakoff began recording the numerous but extremely poorly preserved sculptures that are at the site. Pollock and G. Stromsvik made a reconnaissance of the ruins of Chacchob, reported many years ago to be a walled city like Mayapan. It was discovered that the ruins, a small site about 500 meters in diameter, are in fact surrounded by a wall. The remains inside the wall appear to be of Puuc or Late Classic period rather than of Mayapan times, but further work is needed before it definitely can be stated that later materials are not present.

Other important work in the Maya area has included the following: Ruz has continued restoration at Uxmal; he excavated and restored the large platform in front of the Governor's Palace, finding a rich cache said to include jade, alabaster vessels, flints and beads. Ruz has now left for Palenque, where excavation of the secret stairway inside the Pyramid of the Inscriptions will continue. Pavon Abreu is continuing restoration work at Kabah. At the suggestion of Dr. Kidder, Berlin excavated a mound of the Formative period at Kaminal-

juyu, the results of which necessitate some revision of the ceramic sequence for the area. Archaeologists of the Instituto de Antropologia e Historia of Guatemala report a large new site at Playitas, 30 km northeast of Quirigua. Several fine sculptured heads, resembling those found at Quirigua, have come to light, but as yet no stelae.

MEXICO. During February, the Instituto Nacional de Antropologia e Historia of Mexico established a new Direccion de Prehistoria under the direction of Pablo Martinez Del Rio, also director of the Escuela Nacional de Antropologia e Historia. In addition to Don Pablo, the Direccion de Prehistoria includes A. R. V. Arellano, consulting stratigrapher; Manuel Maldonado Koerdell, paleontologist; and Luis Aveleyra Arroyo de Anda and José Luis Lorenco, archaeologists. This department was created to pursue exploration of the more ancient (preceramic) evidences of man in Mexico, with related geological and paleontological studies. It is thus the first organization in America to be designed especially for this field of research. As its first field project, it began, early in March, to clear a mammoth skeleton under the Texcoco lake bed at Santa Isabel Iztapan, near Tepexpan (See EARLY MAN).

The Instituto Nacional de Antropologia e Historia, under the general direction of Arquitecto Ignacio Marquina, is a dependency of the Ministry of Public Education and Fine Arts. Through its different branches it attends to the study and preservation of all archaeological and historical sites in Mexico. It also conducts research in ethnology, linguistics, history, and physical anthropology; runs the two major historical museums of Mexico in the capital, and a number of smaller regional museums; operates the Escuela Nacional de Antropologia e Historia, which grants professional titles in archaeology, ethnology, linguistics, physical anthropology, and museum craft; and works in close cooperation with the Faculty of Philosophy and Letters of the National University of Mexico. The Direccion de Prehistoria was organized largely through the support of Alfonso Caso, now head of the Instituto Nacional Indigenista. Thus the Mexican government has created an extremely well-integrated and effective mechanism for conducting researches and teaching in all phases of anthropology, which is a model for the Western Hemisphere.

The Museo Nacional has been practically emptied of its treasures temporarily; these, together with the Monte Alban jewelry, have been sent to Paris for a special exhibition of art of ancient Mexico. Marquina, Rubín de la Borbolla, and Acosta are in Paris in connection with this exhibition.

At Teotihuacán, the Atetelco structure with its magnificent murals is being entirely reconstructed by the Instituto, with funds provided by the Wenner-Gren Foundation.

Bernal, with students of Mexico City College, excavated at Tamazulapam in the Mixteca. A very large tomb was found, and the excavation of a central platform brought to light many superpositions. Preliminary study of associated pottery indicates that a ceramics sequence can be worked out.

Jose Melgarejo Vivanco has made a survey in the south of the state of Vera Cruz to determine the extent of the Remojadas culture. At Quiahuiztlan, Veracruz, archaeologists of the state of Vera Cruz, led by Melgarejo Vivanco, have continued large-scale excavations. The extraordinary feature at this site is the presence of tombs constructed like small houses. A ceramic sequence has been worked out. Another important tomb with fine pottery has been uncovered at Isla de Sacrificios. García Payon has continued work for the Instituto at Tajín, concentrating on the ball-courts and the great pyramid, and has also trenched for stratigraphy in the Cempoala region, in Mata Verde (Trapiche), and in Chalahuite.

To the northward, Armillas has worked at La Quemada. J. Charles Kelley of Southern Illinois University, Carbondale, Ill., plans to return to northern Mexico with a field school of 15 students, for archaeological reconnaissance and excavation in northern Durango and adjacent southern Chihuahua. In the Falcón Reservoir area on the lower Río Grande, the University of Texas party headed by Joe Cason, under a research contract with the National Park Service for archaeological salvage, has found a series of very deep lithic sites on the Texas side of the valley, and the area was inspected in April by Luis Aveleyra, archaeologist, and Manuel Maldonado, paleontologist, of the Dirección de Prehistoria of the Instituto. They plan to excavate a large site on the Mexican side of the reservoir next fall or winter (the last remaining season before the reservoir fills in 1953), on the Rio Salado near the town of Guerrero, Tamaulipecas. Maldonado has made a preliminary geological report on the general area.

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JENKS, ALBERT E.
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